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Washington Highlights

United States has more than a 50-year supply of coal and iron ore, but less than a 25-year supply of petroleum, lead, zinc and copper.

The country has practically no domestic reserves of tin, nickel, industrial diamonds, asbestos, or mica, according to a Government report.

The Federal statement is based on a three-year survey made by the Bureau of Mines and the Geological Survey of the Department of Interior. Known reserves were used in the Government compilations.

No mention was made in the report of supplies of uranium, the principal atomic bomb ingredient.

In a foreword to the report, Interior Secretary Krug said it indicates the great need for a national mineral inventory to determine more exactly how large our mineral reserves may be.

On the question of national oil reserves, Undersecretary of the Interior Oscar Chapman believes that security of the country demands additional storehouses of petroleum.

Washington heard that Chapman at the formal dedication of an experimental refining plant near Rifle, Colo., said it was hoped that extraction of oil from shale could be made inexpensive enough to attract private industry and bring about large scale development of this source of oil.

The nation's production of crude petroleum for the 11th straight week has shown a gain and for the second consecutive week crossed the level of 5,000,000 barrels daily, a record high.

Production during the week last reported by the American Petroleum Institute increased 6465 barrels a day over the preceding week's output of 5,015,650 barrels daily.

Petroleum economists predict that daily production for the balance of 1947 should approximate the 5,000,000-barrel figure. The Interstate Oil Compact Commission, the Independent Petroleum Association of America and the Bureau of Mines all generally agree that to fulfill demand, 5,000,000-barrel daily production should be maintained for an indefinite period.

J. V. Brown, statistician and analyst in the Washington office of the Independent Petroleum Association of America, who recently was appointed secretary-treasurer of the National Petroleum Council, has been identified with the oil industry for 20 years.

He gained a valuable background of expreience during these two decades as secretary of PIWC's production committee and the sub-committee on petroleum economics. He also served at one time as vice chairman of the economics advisory committee of the Interstate Oil Compact Commission.

The Navy has indicated that in the future fuel oil bids will be requested on a yearly basis. This is a change from the usual quarterly requirements and it was made to give oil concerns more time to map out a supply program.

Hearings are being held by the War Department in Santa Ana, Calif., on application of the Marine Exploration Co. to drill several test wells offshore from Seal Beach, Calif.

Plans formulated by Marine Exploration call for construction of an island approximately 8100 feet offshore. The island proposed will be composed of a fill, surrounded by sheet steel piling, with wharfage on the lee side.

The question of interest to the War Department is whether such an island would constitute a point of danger to normal navigation.

President Truman has sent to the Senate for confirmation the name of Burton N. Behling to be vice chairman of the Federal Power Commission, succeeding Richard Sachse of California, who recently resigned because of ill health.

Soviet geologists have discovered oil reserves of great proportion under Russia's new industrial area in the mineral-rich Ural Mountains, according to news received in Washington.

Moscow announced discovery of the oil, following a series of exhaustive tests to the Devonian formation.

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A.P.I. Pacific Coast District Spring Meeting Highly Successful

Over a thousand representatives of the drilling and production activities of the western oil industry attended the technical sessions of the Pacific Coast District Division of Production of the American Petroleum Institute, held at the Los Angeles Biltmore Hotel, May 15-16.

At the end of the first day's meeting a capacity audience crowded the Biltmore Bowl to hear guest speaker Manchester Boddy, publisher of the Los Angeles Daily News, speak to them on the question: "America's Position in Europe." "American aid to Europe, he said, is an opiate to ease the death convulsions of a doomed civilization. The Era of the Atlantic is coming to an end and there is little chance of reviving it. The opportunity of the United States lies in the Era of the Pacific," he predicted. China was described as being probably the first nation to become stabilized; and from China other sections of the Orient will gradually develop a mature economy.

Jake L. Hamon, vice president, A.P.I. Div. of Production, also spoke to the dinner meeting. He stated that despite an all-time high in domestic crude production, that the U.S. is now importing about 400,000 barrels a day, and the principal problem of the industry is to produce profitably from depths as great as 12,000 feet.

M. W. Morris, chairman of the A.P.I. Pacific Coast District Division of Production, presided as chairman of the dinner meeting. R. E. Foss, Barnsdall Oil; W. J. Travers, Richfield Oil; Paul Andrews, Signal Oil & Gas Co.; and W. R. Wardner of Conversation Committee, Oil Producers, presided over the day meetings. C. T. Reichert, National Supply Co., was chairman of the General Arrangements Committee. E. V. Watts, General Petroleum Corp., was general chairman of the Spring Meeting Committee.

Public Relations and Company Organization

In addition to the nine technical papers composing the engineering part of the program, John M. Lovejoy, president, Seaboard Oil Co., read a paper on Public Good Will and the Oil Producer; and J. E. Toussaint, general manager, Producing Department, Standard Oil Co. of Calif., addressed the meeting on the relation of organization elements to oil and gas producing operations.

Jake L. Hamon, vice president, A.P.I. Div. of Production, spoke at Dinner Meeting. He stated that despite an all-time high domestic production, the U.S. is now importing about 400,000 barrels of crude daily.

Mr. Lovejoy urged every oil man to join the American Petroleum Institute in its campaign to tell every American that petroleum is a progressive industry, that petroleum must be won from the earth—that initiative and enterprise with the spur of competition are the tools by which it is won. The success of the entire program, the speaker explained, depends primarily upon people within the industry—from producers, refiners, pipeliners, jobbers and marketers right down to the last fellow on the "line," the service station attendant or oil burner repairman.

In his discussion of company organization elements for oil and gas producing operations, Mr. Toussaint divided this phase of an oil company's activities into fourteen subdivisions which included geology, lands and leases, drilling, production, petroleum engineering, warehousing, transportation, gas processing, accounting, labor relations and safety. Each activity was discussed in relation to the department as a whole.

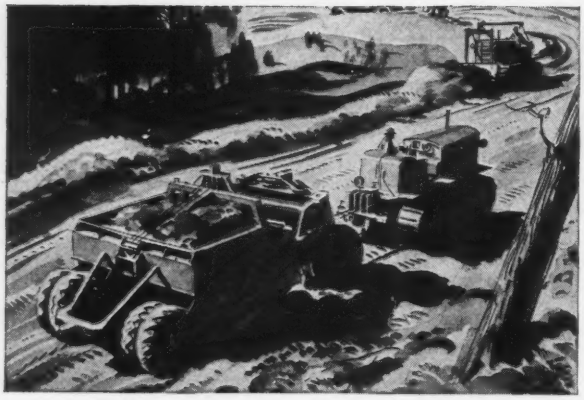
Commenting on petroleum engineering, the author said: "In the drilling of a well, one very important factor, in my opinion, is the working up of what I term a Drilling Program. This not only involves the casing program but involves the determination of the amount, if any, of coring, testing, etc.

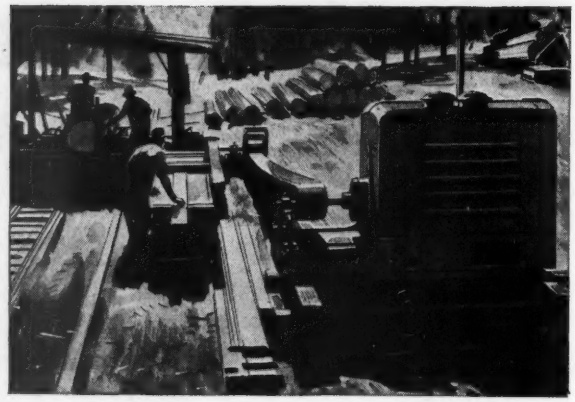
"If too much coring and testing is done, the progress in drilling a well will be slowed down. If not enough is done where warranted, valuable information will not be obtained."

Commenting on future developments the speaker stated, "I think there is already started in California, and we will see much more of it in the future, consideration of pressure maintenance plants, unit plans and secondary recovery projects. These all involve technical features, and competent petroleum engineering advice should be available."

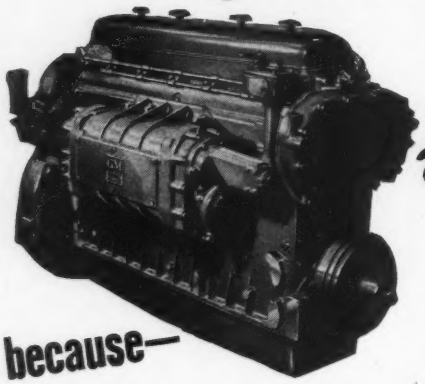
Oberg and Masters on Casing Stresses

In a paper analyzing the determination of stresses in oil well casing in place, C. H. Oberg and R. W. Masters, Standard Oil Co. of Calif., concluded that in establishing a standard casing landing practice, consideration should be given to five important factors. Landing the casing with a given tension does not assure the operator that the tension will remain the same during the life of the well, they believe. Freeze points above the top of the cement may not hold the casing in a fixed position. In choosing a landing ten-





Bring on the hard work



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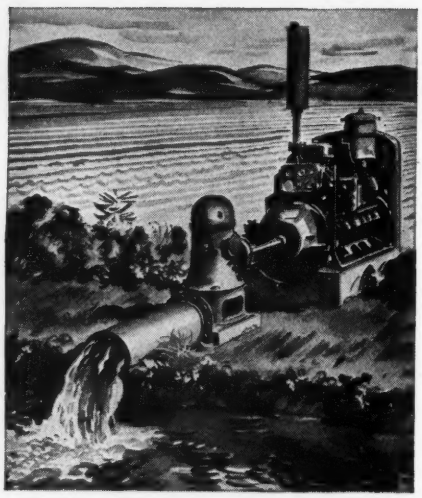

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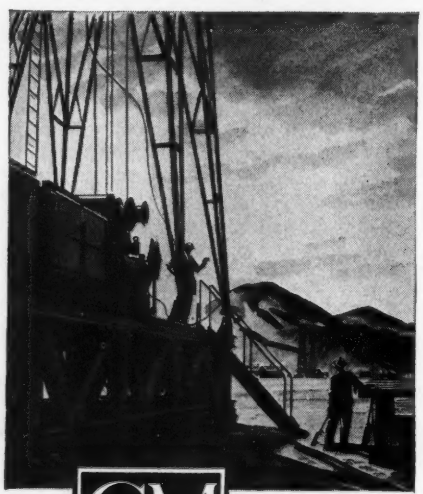

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sion in such wells, all of the casing to the top of the cement should be considered as possibly free to move, it was stated.

It may be possible, it was explained, to allow for both high tension and buckling when landing the casing in wells that will have large fluctuations in temperature and pressure. Either a compromise tension will have to be chosen or it might be desirable in long strings to cement the casing in an additional place through a cement collar to provide a positive freeze point on which to base the landing tension and allow a diminished landing weight. Dynamic stresses in properly landed casing normally should not be dangerous. Pumping cold fluids into casing in wells with high landing tensions should be avoided.

Zweifel and Grunder on Thread Lubricants

The development of threat sealing lubricants was discussed by H. C. Zweifel and L. J. Grunder of the Richfield Oil Corp. The authors believe that the results of their investigation indicate that a major portion of the difficulties encountered with the leaking and galling of all types of threaded members can be eliminated by the use of the proper thread lubricant both at the mill and in the field. The problem of make-up practices should be investigated, possibly on the basis of a cooperative program between the manufacturers of oil country tubular goods and the consumers.

The authors explained that the present specifications established by API are satisfactory, with one exception. The Pitch Diameter of threaded members with reference to the corresponding "actual diameter" is of vital importance in respect to thread damage and "break-off." This one factor, they said, may be of incalculable value in reference to the establishment of more satisfactory make-up practices. Revised mill practice, it was pointed out, of hydraulic testing should accomplish both testing for bursting strength and testing for mill and thread leakage.

Wais on Casing Standards and Design

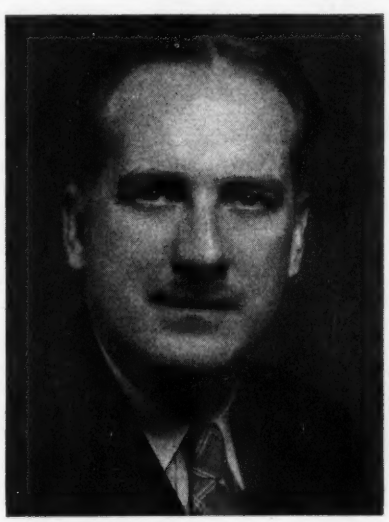
John Wais, Jr., Pittsburgh Steel Co., reviewed recent developments in casing standards and design, and pointed out that important changes in casing standards and design have been proposed during the past five years, but were held in abeyance during the war. Discussions at the 1946 Fall Meeting of the American Petroleum Institute indicated an increased field demand for the revisions, and preliminary developments on several subjects were discussed by the author.

E. V. Watts, General Petroleum Corp., headed the Spring Meeting Committee.

A proposal to increase casing thread standoff one turn was acted on favorably, subject to letter ballot, he said. This change permits one more turn of makeup during the assembly of the couplings by the manufacturer as well as in running pipe in the field. Greater care will be required to develop this additional makeup without damaging the pipe or couplings either due to thread friction or crushing with tongs. Flattening combined with notching may cause serious reduction in bursting strength.

Coupling stresses due to makeup and internal pressure were described as additive according to analytical investigations, and the added make-up combined with high pressures results in values which should not be disregarded in designing for increased tensile and burst requirements.

Higher internal test pressures are being requested by users, the speaker said, and more definite values for maximum test requirements are required to permit proper design of testing equipment. He added that higher strength casing joints utilizing upsetting and various methods of treating to increase strength are being developed. Joint strength data for information purposes were approved for publication by the main Pipe Committee at the 1946 Fall A.P.I. Meeting.



Malcolm W. Morris, Standard Oil Co. of Calif., 1947 Chairman, Pacific Coast District, A.P.I. Division of Production.

Stick, Baker and Norelius on Electrical Logging

New electrical logging techniques in California were discussed by J. C. Stick, Jr., J. S. Baker, and R. G. Norelius, Lane-Wells Co. It was explained that since the conclusion of the war, electrical logging has made considerable progress in the solution of several pertinent problems. These include fresh water-oil san differentiation, improvement in the accuracy and usefulness of logs made in oil base drilling fluids, and the adaptation of resistivity curves to highly interbedded strata. Improvement in oil base logs, the authors stated, has centered around three approaches: Reducing both the magnitude and intermittent nature of the electrical contact; the design of measuring circuits capable of establishing essentially constant formation current over a wider range of resistance variations; and the incorporation of means for smoothing out the remaining effects of contact

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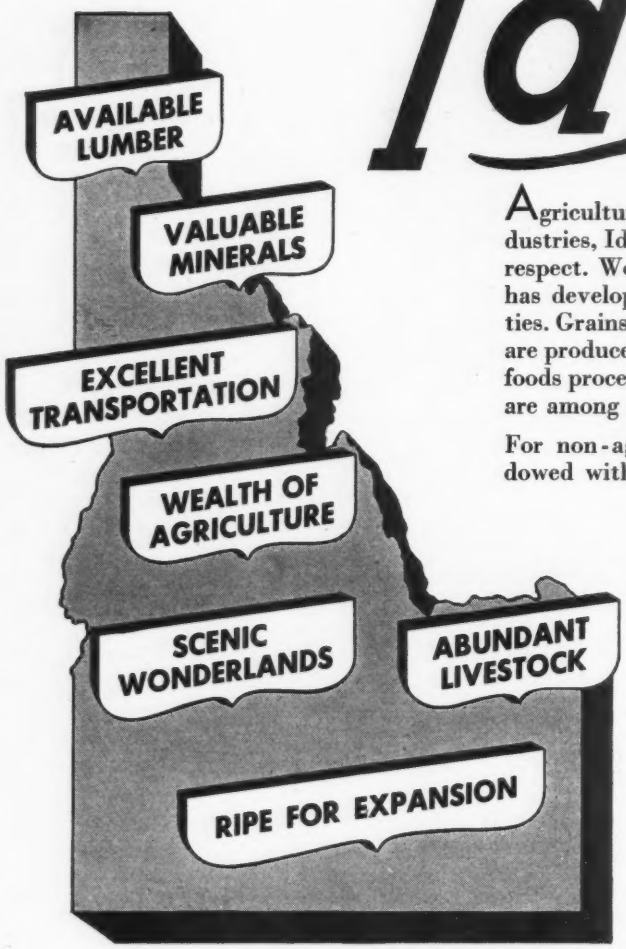
TREASURE MAP OF INDUSTRY

Idaho*



Agriculture being the life-blood of many industries, Idaho is particularly fortunate in that respect. World-famous for the Idaho potato, it has developed many other agricultural activities. Grains, vegetables, fruit... cattle and sheep are produced in abundance. Dehydration, frozen foods processing, dairying, canning and packing are among the state's flourishing industries.

For non-agricultural industries, Idaho is endowed with rich veins of minerals. Numerous manufacturers of stone, clay and glass products have established plants in Idaho. Lumber for building and wood products is available. Unsurpassed rail transportation is provided by Union Pacific.

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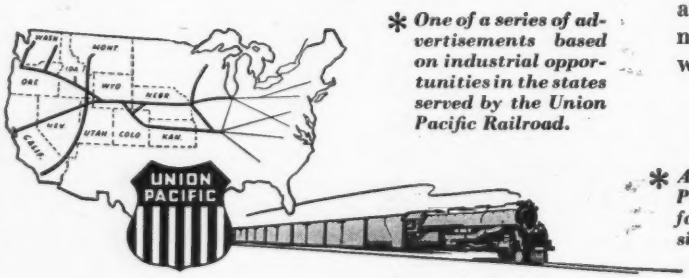
Idaho is a young thriving state, ripe for further industrial development. It offers good living and working conditions, good schools, splendid cultural advantages . . . and its energetic citizens assure newcomers of a true western welcome.



* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

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THE STRATEGIC MIDDLE ROUTE

variation on the measuring circuit.

Doll, Legrand and Stratton on True Resistivity

The determination of true resistivity from the electric log, and its application to log analysis, was reviewed by H. G. Doll, J. C. Legrand and E. F. Stratton, Schlumberger Well Surveying Corp. The true resistivity of formations **in situ,** the authors conclude, can be determined for the case of no invasion, if the mud resistivity and the bore hole diameter are known opposite the formations, when a given electrode spacing is used to measure the apparent resistivity.

Similarly, it was shown, the true resistivity of invaded formations can be evaluated, provided several well chosen electrode spacings are used, and provided the mud resistivity and the bore hole diameter have been determined opposite the formation. Emphasis should be placed on the importance of accurate determination of the mud resistivity, with proper correction for temperature, it was declared. The resistivity departure curves constitute a valuable means for true resistivity determinations. The use of the curves will greatly assist in the interpretation of electric logs, it was advanced, particularly with respect to quantatitative analysis of permeable functions.

Radford on the Selection of Completion Fluids

H. E. Radford, Shell Oil Co., in a paper which considered factors influencing the selection of mud fluid for completion of wells, believes that substantial field evidence exists to show the harmful effects resulting from contact of normal clay-water muds with an oil sand. It would therefore, he says, be logical from a technical standpoint to use either oil-base mud or crude oil as a completion fluid in every well to avoid any infiltration of water into the sand. From a practical standpoint, however, cases are found where either normal clay-water mud, or one of the special water base muds such as drilling emulsions, starch mud, or carboxymethylcellulose mud can be used logically and on a sound economic basis. The selection of the particular special water mud to use requires analysis of well conditions to be met, and adaptation of the mud best suited to those conditions. Under circumstances where sands have a low permeability and at the same time are strongly affected by water, or where a particularly thin mud sheath is required, use of oil-base mud is definitely indicated and the payout is apparent, the author concludes.

Charles T. Reichert, National Supply Co., acted as chairman of the A.P.I. District General Arrangements Committee.

Wade on the Evaluation of Completion Practices

The evaluation of completion practice from productivity index and permeability data was analyzed by F. R. Wade, Union Oil Co., and he showed that production effectiveness is the ratio of the calculated absolute reservoir permeability to the average air permeability determined by core analysis. It therefore has a theoretical maximum value of unity and should remain constant throughout the life of the well, he said. Empirical data were shown to indicate that the production effectiveness is reasonably constant through a large part of the producing history of a well, and that it has approximately the same magnitude for a wide variety of reservoir and well conditions.

For individual pool and gross data, the author explained, it is shown that the length of time necessary to drill into the zone and complete a well will appreciably affect the production effectiveness. Gross correlations also indicate a slight advantage of slotted liner completion over gun perforated completions in production effectiveness. Gross correlations indicate no advantage for special and oil base muds over water base mud in production effectiveness, he said, but it is demonstrated that this conclusion is apparently the result of unequal weighing of data. Individual pool correlations show an advantage of oil base mud over water base in the two cases for which sufficient data for testing this relationship were available, he concluded.

Winterburn on Unconsolidated Sands

Read Winterburn, Union Pacific Railroad Co., in a discussion of the control of unconsolidated sands in Wilmington oil field wells, advanced the conclusions that: Sand can be successfully controlled through the use of 0.131″-0.187″ or smaller gravel in gravel packs and 0.093″-0.131″ or smaller gravel in prepacks. (Early performance of prepacks using 0.093″-0.250″ gravel indicates results similar to those obtained with 0.093″-0.131″.) Use of larger gravel as well as slots of 0.030″ width, round holes of 3/32″ diameter and 15 or 20-mesh wire-wrapped liners will not prevent sand trouble. Final conclusions as to results to be obtained with slots of less than 0.030″ width cannot be arrived at due to the relatively short experience in most of the wells so equipped.

The plugging of gravel-packs and prepacks causes a more rapid decline in productive index than that which occurs when conventional liners are used. Greater economic returns during the early history are realized from gravel-packed or prepacked wells designed to screen all sand due to ability to produce at higher rates without sand trouble and because of the lower production costs. The cost of remedial measures necessary for the restoration of productivity in plugged gravel-packed and prepacked wells will be no greater than the redrilling cost to be expected with conventional liners.

(Continued on Page 49)

A well-known family in medieval Italy, the Borgias, were reputed to have used certain chemical formulas with startling effects . . .

Certain chemicals, in more or less general use for years, are capable of transforming an ordinary tomato into a gorgeous "strawberry" . . .

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DEHYDRATING — DESALTING

47-F

Fluidynamics and Thermodynamics of Hydrocarbon Separation Processes

Continued from First May Issue

By Wayne C. Edmister
Hydrocarbon Research, Inc.
115 Broadway, New York

Thermodynamic Efficiency

It is of interest to consider hydrocarbon separation operations from the standpoint of the thermodynamic efficiencies which necessarily involves entropy. In a petroleum refinery or natural gas plant, energy is usually available at a sufficiently low cost so as to make energy utilization efficiency of secondary importance to the efficiency of separation and recovery. Conditions are changing in many locations in the direction of more costly fuel so that economy is becoming more important. In considering the thermodynamic efficiency of hydrocarbon processes such as a fractionation, absorption, etc., it is necessary to take into account the composition of the feed stock and the desired products and also the levels at which energy is supplied and rejected. Some of the energy may be supplied as heat and some as pumping or compressing power. In this discussion the attention will be devoted to hydrocarbon absorption and fractionation.

The energy added in a separation process is that necessary to maintain pressure and temperature conditions and the required interstage flows of liquid and vapor and also provide for the changes in the energy contents of the products over that of the feed. The addition of heat occurs at a high temperature level and the rejection of heat occurs at a low temperature. Thus heat flows through the process from the reboiler to the condenser. The work equivalent of these heat quantities is the difference in their entropies multiplied by the absolute temperature of the environment to which heat is being rejected; for example, the cooling water. This energy goes into the system doing the work of separation with consequent losses due to the irreversibility of the process. The minimum work of separation is determined by the enthalpy and entropy changes in the components in going from feed to products and the absolute temperature of the environment. The minimum work for a given separation is a function of the feed stock and the products and independent of the process used. On the other hand the actual work required for a given separation is very definitely a function of the type and design of the separation process.

The ratio of the minimum to actual works of separation is the thermodynamic efficiency of a separation process. This definition of the thermodynamic efficiency is shown in equation shown on Figure 10. It will be noted that both the numerator and the denominator contain a temperature term, which is the environment and is not to be confused with the reference temperatures used in computed enthalpies and entropies.

Also shown on Figure 10 are the equations for the enthalpy and the entropy of gaseous mixtures. Similar equations can be written for liquids and would include terms for mixing and for pressure effects. These equations are very complex and will not be presented here because of unnecessary complications.

The thermodynamic efficiency and the reversibility of a separation process are related as the degree of reversibility of a separation process indicates the extent to which the work may be made to approach the minimum required by thermodynamics to effect the separation. Separation processes may be classified as **potentially reversible, partially reversible and non reversible.**

A separation process is called **potentially reversible** when the work can theoretically be reduced to that required by thermodynamics. Fractional distillation is an example of potentially reversible process. A separation process is said to be partially reversible when most of its steps are potentially reversible but a few are irreversible. Absorption and extractive distillation are parti-

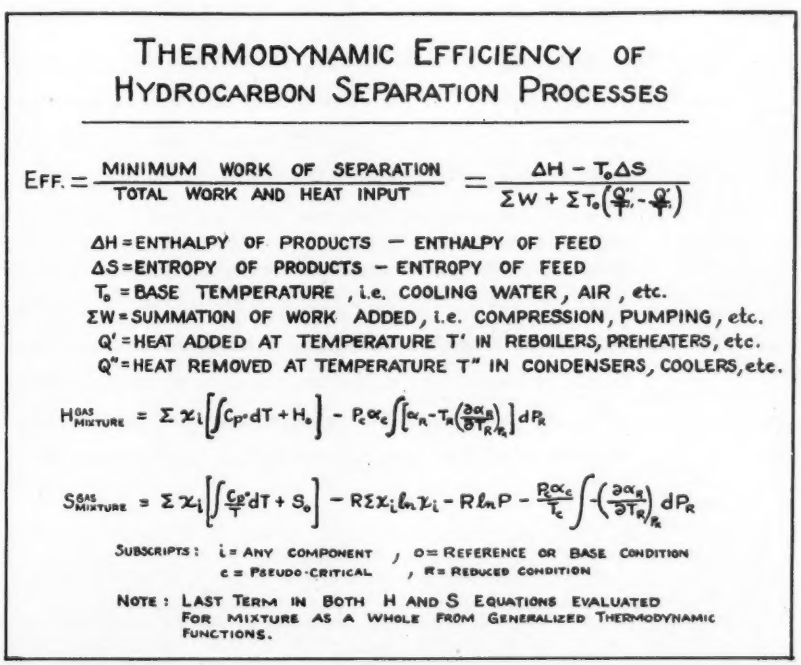
THERMODYNAMIC EFFICIENCY OF HYDROCARBON SEPARATION PROCESSES
EFF. = MINIMUM WORK OF SEPARATION / TOTAL WORK AND HEAT INPUT = ΔH − T₀ΔS / ΣW + ΣT₀(Q'/T' − Q''/T'')
ΔH = ENTHALPY OF PRODUCTS − ENTHALPY OF FEED
ΔS = ENTROPY OF PRODUCTS − ENTROPY OF FEED
T₀ = BASE TEMPERATURE, i.e. COOLING WATER, AIR, etc.
ΣW = SUMMATION OF WORK ADDED, i.e. COMPRESSION, PUMPING, etc.
Q' = HEAT ADDED AT TEMPERATURE T' IN REBOILERS, PREHEATERS, etc.
Q'' = HEAT REMOVED AT TEMPERATURE T'' IN CONDENSERS, COOLERS, etc.
H GAS MIXTURE = Σ x_i [∫ C_p° dT + H₀] − P_c α_c ∫ [α_R − T_R (∂α_R/∂T_R)_{P_R}] dP_R
S GAS MIXTURE = Σ x_i [∫ (C_p°/T) dT + S₀] − RΣx_i ln x_i − R ln P − (R α_c / T_c) ∫ −(∂α_R/∂T_R)_{P_R} dP_R
SUBSCRIPTS: i = ANY COMPONENT, 0 = REFERENCE OR BASE CONDITION
c = PSEUDO-CRITICAL, R = REDUCED CONDITION
NOTE: LAST TERM IN BOTH H AND S EQUATIONS EVALUATED FOR MIXTURE AS A WHOLE FROM GENERALIZED THERMODYNAMIC FUNCTIONS.

Figure 10

TCC REQUIRES MINIMUM MAINTENANCE...

not only in money, but in man-hours!

In catalytic cracking, it's the over-all on-stream efficiency that counts. And that depends not only on long runs but on short down time for turn-around.

One Houdry licensee recently turned around two TCC units with an expenditure of only 16,000 man-hours. Another turned around two units with 25,000 man-hours. A third turned around a single TCC unit with only 9,700 man-hours. The on-stream periods of these five units had averaged better than 200 days. They were turned around with an expenditure of less than one man-hour per year per barrel of daily thru-put!

These are typical—not extraordinary—examples of how TCC's basic simplicity of design pays off in minimum maintenance. Its shorter turn-around time saves money and man-hours. This is of particular advantage in refining operations of relatively small size, where a single catalytic unit is the only source of high-quality fuel. It is easy for such a refiner to build up, in advance of turn-around, a sufficient backlog of catalytic motor fuel to keep him in production throughout the brief turn-around period.

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ally reversible processes. Absorption is not a potentially reversible process because the entering lean oil is not in equilibrium with the exit gas. In this discussion we are not concerned with irreversible processes such as diffusion and centrifuge. Considering counter-current stage hydrocarbon separating apparatus such as absorbers and fractionators from a standpoint of thermodynamics, the following observations can be made:

Absorption would be a potentially reversible process if the lean oil contained enough of the light components to make it in equilibrium with the exit gas. As practiced, therefore, absorption is not reversible and the composition of the exit gas and the pressure are not sufficient to fix the temperature. The thermodynamic efficiencies of such a process are low because of the amount of energy that must be supplied in the stripper to strip the lean oil.

Fractional distillation is a potentially reversible process with the tops and bottoms in equilibrium with the phases which they left. The thermodynamic efficiency of this process, which is highest of all separation processes, can be increased by adding heat incrementally to each tray in the stripping section and removing heat incrementally from each tray in the enriching section. Such a procedure would be of interest only where there is a use for the heat removed and where heat is available more cheaply at lower temperatures than at the reboiler temperature.

The thermodynamic efficiency of a fractionator can be very useful in determining the proper design to use for a given separation. This is the limiting efficiency that can be approached in design and should be of considerable interest.

Narrow boiling feed stocks have a smaller difference between the reboiler and the condenser temperatures so that the levels at which heat is supplied and rejected are not very far apart. However, to offset this, the narrow boiling feed stocks require more reflux to separate them. These two effects are compensating so that the result is that the thermodynamic efficiency

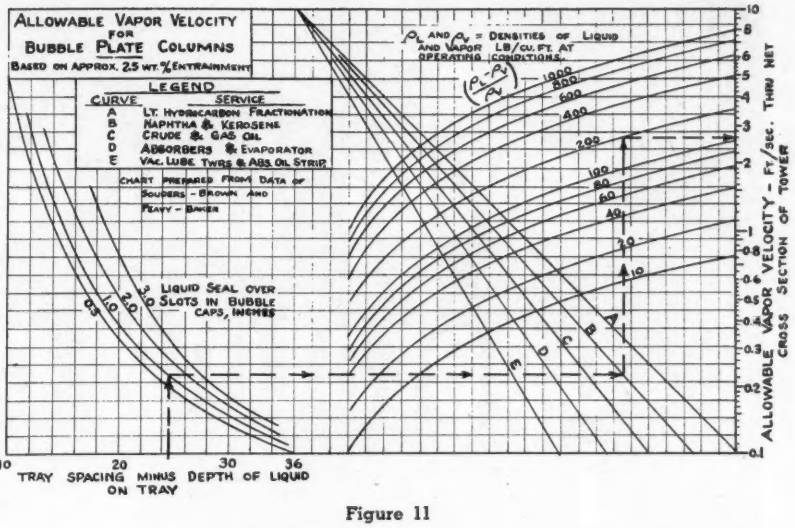

Figure 11

is principally a function of the feed composition and the desired sharpness of cut.

Figure 9 shows a fractionator as a series of equilibrium flash vaporization stages with the interstage flows of vapor and liquid indicated. In a process such as this, it is customary to add the heat all at the reboiler and reject all the low grade energy at the condenser. This case of operation is referred to as Case I in the heat graph of Figure 9. The same interstage flows and the same temperature gradient could be maintained by adding heat at each stage in the stripping section and removing heat from each stage in the enriching section. In this way the heat would be supplied at different temperature levels and likewise, rejected at different temperature levels. In some cases this might be an advantage commercially. From a theoretical point of view, Case II has a higher thermodynamic efficiency.

In computing the entropies and enthalpies of the feed and products for the evaluation of the minimum work of separation and thermodynamic efficiency, as defined on Figure 10, it is imperative that the reference point be the same for all components or streams so that all values will be consistent. Where both phases are involved as would be if the feed is in the liquid phase, the overhead in the vapor phase, and the bottoms in the liquid, the entropy and enthalpy evaluations could refer to the conditions of one of the streams, such as the feed or the overhead, etc. The customary reference state is vapor at zero pressure and a standard temperature of say, 25°C, or saturated liquid at some low temperature. The objection to the latter is that it is difficult if not impossible to use it generally without confusion because of the wide spread of boiling points and vapor pressures for hydrocarbons. This point is emphasized with the hope that some agreement and standardization on entropy and enthalpy data might also be accomplished as part of this program of coordinated hydrocarbon development study advocated in this paper.

Referring to Figure 10, the equation for the enthalpies of a gaseous mixture involves two terms; the first term is the summation of the individual enthalpies for the components and the second term is the isothermal pressure correction which is evaluated for the mixture as a whole. The reference point is zero pressure and any low convenient temperature. The equation for the entropies of a gaseous mixture involves four terms; the first two terms being summation terms. The first term is the summation of the individual entropies of the components in the mixture, the second term gives the entropies of mixing, while the third term gives the ideal gas isothermal pressure correction, and the last term gives the isothermal pressure correction that is necessary because of deviation for the ideal gas law.

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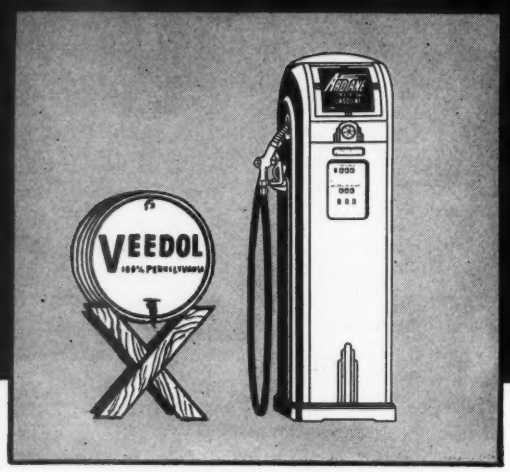

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The last term in each of these two equations would be zero for an ideal gas. These terms may be evaluated from the generalized thermodynamic properties of hydrocarbon developed by this author (25, 26).

It is frequently preferable to consider the thermodynamic efficiency of the entire separation plant, including compressors and other auxiliaries rather than computing it just for the fractionation tower alone. In this way all the pumping and compressing work may be included in the balance. Including all the facilities of a given hydrocarbon separation plant in the calculations of the thermodynamic efficiency permits evaluating alternate flow schemes. Where there are two towers operating in series on the separation of a narrow boiling hydrocarbon fraction, it is sometimes possible to use the heat removed from the condenser of the first tower to reboil the second tower. This improves the thermodynamic efficiency of the entire system.

Plate Efficiency

The function of a bubble plate is to bring the vapor and fluid phases into contact in order that interphase transfer of heat and material may take place. In some cases the controlling operation is the transfer of heat; but in most cases the heat transfer is easily accomplished while getting the desired transfer of material. In such towers as crude distillation and cracking unit fractionators where intermediate reflux is employed the trays involved in this operation act as heat transfer contact devices as much as material transferring units, but there are rare cases of heat transfer controlling. The efficiency of a bubble plate as a contact device for transferring material is not necessarily the same that it would have as a heat transfer unit. It is true that some of the factors such as the mechanical design effects both efficiencies in the same direction; however, transfer of heat involves conductivity and the transfer of material involves the diffusivity. The performance of any plate is dependent on many factors: (a) Mechanical design of plate, (b) Character of liquid and vapor fluids, and (c) thruput rates. In addition the methods and data used in analysing performance data to obtain plate efficiency inffluence to some extent the plate efficiencies obtained.

Plate efficiency may be expressed in different ways, the most convenient being over-all plate efficiency, which is the ratio of the number of theoretical or equilibrium contacts to the number of actual stages or plates required to effect the desired separation. Another way of expressing the efficiency is the local efficiency which might be either a single point or a single stage or plate. These local efficiencies are referred to as the Murphree (59) efficiencies and may be expressed in terms of the liquid or vapor, depending upon the phase that is controlling. In either case the Murphree efficiency is the ratio of the actual composition change divided by the change that would have occurred had equilibrium been reached. Where the vapor film is controlling, the efficiency is expressed in terms of the change in the vapor concentration. Where the liquid is controlling, the efficiency is expressed in terms of the changes in the liquid concentration. For hydrocarbon fractionization and absorption, it is not definitely known which is controlling the liquid or the vapor. In general we can say that the vapor expression for the Murphree efficiency should be used where the greatest change occurs in the vapor phase and by the same logic the liquid expression should be used where the greatest change occurs in the liquid phase. In fractionation and absorption both liquid and vapor are changing. The controlling phase in absorption is probably the liquid because of the relative molal quantities of gas and liquid, the gas usually being higher. For fractional distillation either liquid or vapor might be controlling depending upon conditions. It is customary to use the vapor equation for the Murphree local efficiency. When the plate efficiency is near 100% it does not make any differnce whether the vapor or the liquid expression is used.

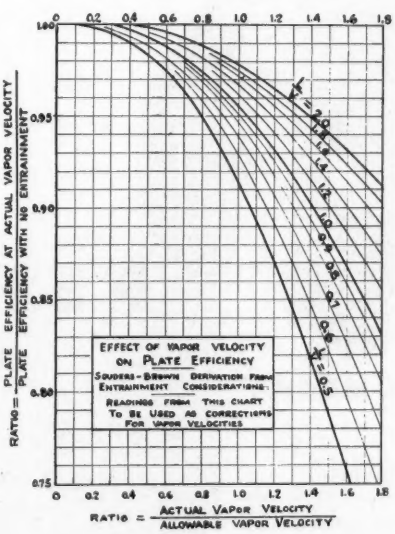

Figure 12

Applying the Murphree efficiency to a bubble plate involves the assumption that the liquid on each plate is well mixed and that the vapor-liquid contact is between phases that are of uniform composition. In commercial bubble plates where there is a cross flow of liquid and where the vapors are not always well mixed this ideal situation does not exist. Accordingly the practice is to apply this equation to average compositions. Local efficiencies can, therefore, be greater than 100% because of the fact that the vapors are contacting a liquid of changing composition as it flows across the plate. The effect of the character of the stock determines the local or point efficiency, which may be lower than the over-all efficiency. The Murphree local or point efficiencies are not very convenient to use in process engineering calculations, so the practice is to use over-all plate efficiencies and to obtain the number of actual plates required for a given number of theoretical plates. The over-all plate efficiency will usually fall in between the local or point efficiency and the stage or plate efficiency, the local efficiency being the lowest and the plate efficiency being the highest of the three. This discussion will be primarily concerned with the over-all plate efficiency. In approaching this subject one should bear in mind the fact that although there is considerable literature on the subject it has not been very thoroughly and

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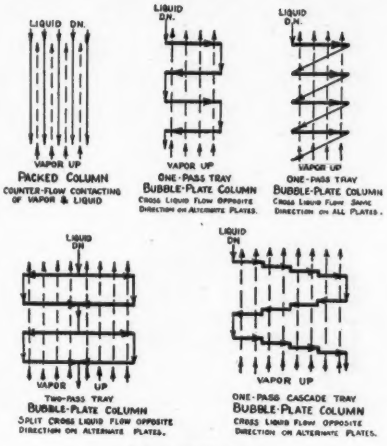
completely analyzed as yet. In this discussion reference will be made to these contributions, which throw considerable light on the subject and serve as guides in planning further work on this subject. Several interesting references on this subject are included in the literature list (7, 13, 16, 19, 30, 31, 32, 48, 54, 59, 60, 62, 65, 66, 72, 79, 80, and 91).

The over-all plate efficiency of fractionators and absorbers is determined by both the mechanical design of the bubble plates and the physical properties of the vapor and liquids involved and also by the flow rates of vapors and liquids. The effects of the mechanical design features of bubble plates and their down-comers on the capacity of the column will be discussed later. At this point the interest is in the effect on plate efficiency.

The function of the bubble plate is to bring about intimate contact between the liquid and vapor phases which of course involves the design of the bubble caps and the spacing as well as the relative rates of liquid and vapor. There is an optimum vapor velocity for any column below which the velocity is too low to get efficiency contact between phases, and above which the velocity is so high that entrainment causes carryover and decreases the efficiency. Entrainment is also a criterion for sizing the columns. The subject of entrainment and the effect on plate efficiency has been investigated several times (1, 16, 65, 79, 83, 85, and 91). Entrainment effects plate efficiency in proportion to the amount of liquid particles carried over by the gas. This upward movement of liquid particles from plate to plate is a function of the vapor velocity, the properties of the vapor and liquid, the plate spacing and the liquid seal over the bubble caps. With an efficient contacting of vapor and liquid there is certain to be some entrainment. A practical design involves setting an optimum entrainment, which involves balancing contacting effectiveness versus liquid entrainment. This is usually done in terms of allowable vapor velocity, which is defined as the vapor velocity to give an allowable amount of entrainment.

Figure 11 is a plot of the allowable vapor velocity for bubble plate columns as a function of the plate spacing, the liquid seal on the bubble cap, the type of service, and the densities of the vapor and liquid phases at the tower conditions. This allowable vapor velocity is based on a given amount of entrainment, which may be considered as optimum for correct operations. This chart was based upon published works of Souders and Brown (83) Peavy and Baker (65) and other miscellaneous information. It is not intended that this chart should be considered a final development, but as only an indication of the relative effects of the variables involved.


LIQUID DN.
VAPOR UP
PACKED COLUMN
COUNTER-FLOW CONTACTING OF VAPOR & LIQUID
ONE-PASS TRAY BUBBLE-PLATE COLUMN
CROSS LIQUID FLOW OPPOSITE DIRECTION ON ALTERNATE PLATES.
ONE-PASS TRAY BUBBLE-PLATE COLUMN
CROSS LIQUID FLOW SAME DIRECTION ON ALL PLATES.
TWO-PASS TRAY BUBBLE-PLATE COLUMN
SPLIT CROSS LIQUID FLOW OPPOSITE DIRECTION ON ALTERNATE PLATES.
ONE-PASS CASCADE TRAY BUBBLE-PLATE COLUMN
CROSS LIQUID FLOW OPPOSITE DIRECTION ON ALTERNATE PLATES.

VAPOR-LIQUID CONTACT STAGE FLOW PATTERNS

Figure 13

Figure 12 shows the effect of vapor velocity on plate efficiency.

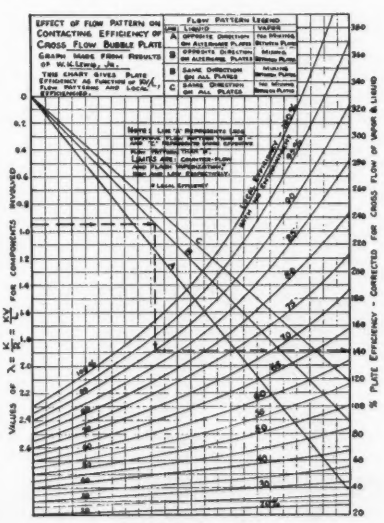

EFFECT OF FLOW PATTERN ON CONTACTING EFFICIENCY OF CROSS FLOW BUBBLE PLATE
FLOW PATTERN LEGEND
LIQUID
VAPOR
% PLATE EFFICIENCY - CORRECTED FOR CROSS FLOW OF VAPOR & LIQUID

Figure 14

This graph is a replot of the Souders and Brown (83) derivation from entrainment considerations and as can be seen from the figure gives the correction for the plate efficiency as a function of the L/V ratio and the ratio of actual to allowable vapor velocities. This chart is considered for reference only.

The over-all plate efficiency of a bubble plate column may be considered as a function of the basic point efficiency, which is a function of the fluid properties, and the corrections for entrainment and for the vapor-liquid flow patterns. For most commercial operations it is not necessary to be this complex because the columns are uniform in design and operate at approximately the same relative vapor velocity and flow pattern which makes these effects cancel out, giving the plate efficiency as a simple correlation of the physical properties of the fluid. However, there are special cases where this situation is not true and it is necessary to adjust the plate efficiencies for vapor velocity, flow patterns, etc. Petroleum process engineers should keep these factors in mind so as to avoid making errors when they encounter special bubble plates. It is with this in mind that this discussion is offered.

Figure 13 illustrates the different flow patterns encountered in commercial operations. For purposes of comparison the packed column is shown along with the cross flow plates for one and two pass operations. From these diagrams it can be seen that the flow pattern can have an appreciable effect on the plate efficiency although the local efficiency is independent of the flow pattern. This is easily understood when one considers the fact that the liquid enters on one side of the plate from the plate above rich in the less volatile components, flows across and leaves the opposite side leaner in the less volatile components. The vapor to the plate may or may not be well mixed and of uniform composition, which has an effect on plate efficiency and which is dependent upon the turbulence. Two assumptions are possible, thorough mixing between stages and no mixing stages. Likewise there are different possibilities for liquid flow;

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cross flow in opposite directions on alternate plates and cross flow in the same direction on all plates. These two cases for each vapor and liquid give four pattern combinations of interest in this discussion.

W. R. Lewis, Jr., (54) analyzed the effects of liquid and vapor flow patterns on the plate efficiencies of a binary system and showed the relative efficiency of a plate as compared with the local efficiency. This work was done using the Murphree efficiency and assuming a straight equilibrium line for the region being considered. From these results Figure 14 has been prepared to show the effects of KV/L, flow-pattern, and local efficiency on the plate efficiency. The four different flow patterns used in preparing Figure 14 may be visualized more clearly by reference to Figure 13. It should be pointed out that the local efficiencies given on Figure 14 are the Murphree type efficiencies and have not been corrected for the flow pattern or for entrainment. The local efficiencies reflect only the characteristics of the fluid. In using a chart of this kind it is necessary to estimate the local efficiencies from properties of the fluid and then use this basic efficiency in applying Figure 14. A further correction is necessary for entrainment. This entrainment correction can be made by using Figure 12.

The physical properties of the mixture are the controlling variables in determining local efficiencies. The plate efficiencies of fractionating and absorbing columns are known to be functions of the temperature and pressure conditions of operations as well as the physical properties of the material. The most important physical property of hydrocarbons, as far as correlating efficiencies is concerned, is the viscosity. Figure 15 is a replot of the correlation developed by Drickaner and Bradford (19). This graph shows the over-all plate efficiency as a function of the molal average viscosity for the feed stock at the average tower temperature. This correlation was developed from an analysis of plant operating data, most of the data coming from a petroleum refinery although some of the data used were taken from the literature.

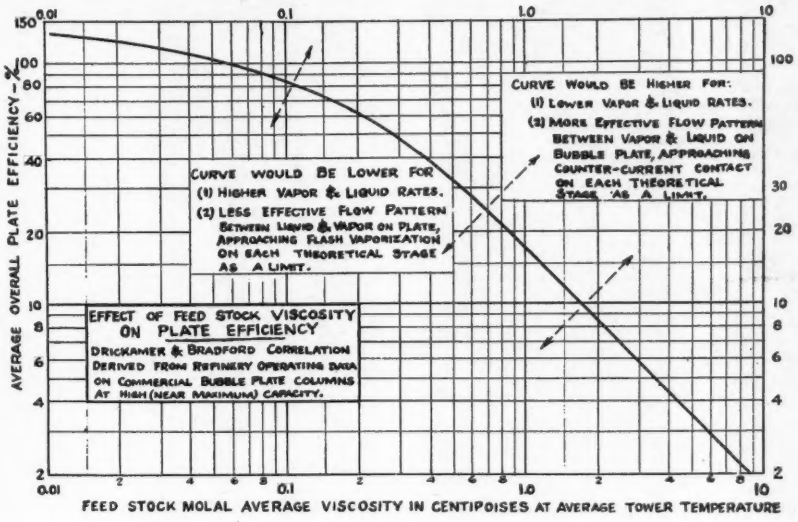

AVERAGE OVERALL PLATE EFFICIENCY - %
FEED STOCK MOLAL AVERAGE VISCOSITY IN CENTIPOISES AT AVERAGE TOWER TEMPERATURE
EFFECT OF FEED STOCK VISCOSITY ON PLATE EFFICIENCY
DRICKAMER & BRADFORD CORRELATION DERIVED FROM REFINERY OPERATING DATA ON COMMERCIAL BUBBLE PLATE COLUMNS AT HIGH (NEAR MAXIMUM) CAPACITY.
CURVE WOULD BE LOWER FOR (1) HIGHER VAPOR & LIQUID RATES. (2) LESS EFFECTIVE FLOW PATTERN BETWEEN LIQUID & VAPOR ON PLATE, APPROACHING FLASH VAPORIZATION ON EACH THEORETICAL STAGE AS A LIMIT.
CURVE WOULD BE HIGHER FOR: (1) LOWER VAPOR & LIQUID RATES. (2) MORE EFFECTIVE FLOW PATTERN BETWEEN VAPOR & LIQUID ON BUBBLE PLATE, APPROACHING COUNTER-CURRENT CONTACT ON EACH THEORETICAL STAGE AS A LIMIT.

Figure 15

Referring to Figure 15, it will be noted that the quantitative effect of higher and lower capacities and also the flow pattern are indicated. This trend is for reference only and should indicate the avenues of possibilities for future study of this subject.

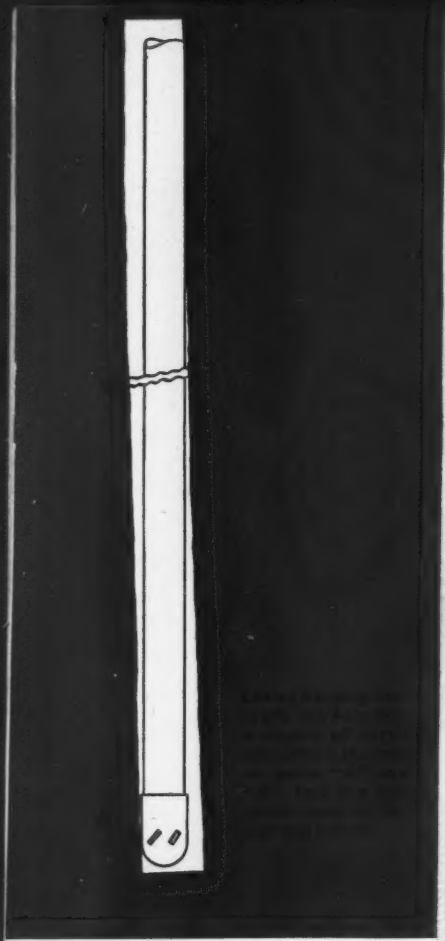
O'Connell (62) correlated plate efficiency as a function of viscosities and the relative volatility of the key components, both being taken at the average column conditions. By introducting the relative volatility as an additional variable to a function of feed stock viscosity, O'Connell improved the correlation of plate efficiency. For absorbers a slightly different combination of variables was used; namely, Henry's law constant and pressure (this combination being expressed as a ratio of specific gravity of the liquid to product of the equilibrium vaporization constant of the key components and the molecular weight of the liquid) divided by the viscosity of the absorbent.

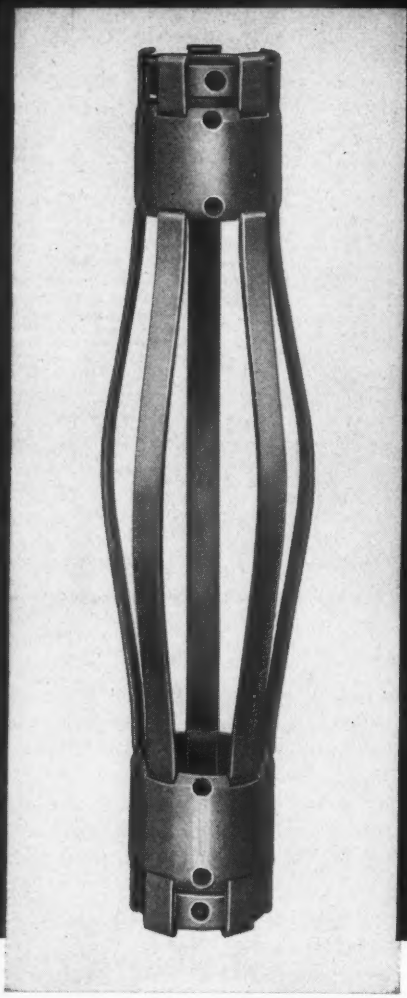
There is considerable room for improvement in the plate efficiency "know-how." It appears that it would be preferable to have one correlation for the basic local or point efficiencies as a function of the physical properties of the fluids and other correlations to give corrections to this basic efficiency for the entrainment, flow rates, and flow patterns. Over-all plate efficiencies may then be estimated by combining the readings from these different correlations. It should be clearly understood that the charts presented here are for reference only. A thorough treatment of the subject will involve more consideration of the bubble plate details. The latter subject has been dealt with to a certain extent by investigations (7, 13, 36, 83) referred to in the references. It is not within the scope of this article to attempt a complete treatment of plate efficiency.

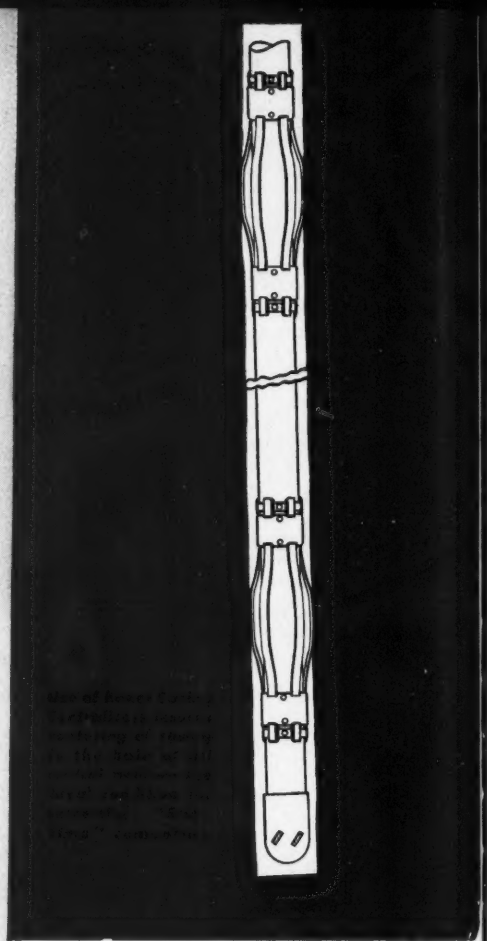
The efficiency information for developing correlations must be obtained by analysing plant performance data in an intelligent manner and developing correlations that will be consistent throughout. This means using the same phase equilibrium and enthalpy data and theoretical calculation method in analyzing the performance data that are to be used in applying the results in design calculations.

From the works of Lewis and O'Connell both involving the component equilibrium constant, it would appear that the plate efficiency should be estimated for each different component. However, this additional trouble may not be necessary due to the fact that accuracy is not very important for components lighter and heavier than the keys.

As mentioned above, the mechanical design of a bubble plate determines its capacity and contacting efficiency. The design may be made







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to approach counter-current flow and exceed equilibrium stages by properly routing the liquid and vapor. Considering the tower as an exchange device for the interphase transfer of heat and material, should be helpful in designing bubble trays.

Plate efficiency is usually considered as applying to the transfer of material but it is obvious that the effectiveness of a phase contacting device to exchange heat is also very important. Therefore, we must consider phase contacting devices as heat exchangers as well as material exchangers. Heat is transferred from the vapor to the liquid phase by direct and intimate contact. The heat and material transfer operations are so interrelated that it is difficult to analyze them without making some simplifying assumptions. It can be appreciated that heat transfer capacity might determine a bubble plate's efficiency in one case and material transfer capacity in another. For example, a low temperature gradient, i. e., low temperature difference between the vapor and liquid entering a tray, and a high reflux ratio gives a situation where there is a lot of heat to transfer but a low driving force. This might be the case in precisely fractionating a narrow charge to yield commercially pure hydrocarbons. On the other hand a high temperature gradient and low reflux ratio would give a high temperature driving force and a low heat duty. This might be the case when making a less sharp split of a wide boiling charge stock. A somewhat compensating factor is the number of stages, more stages always being required for the sharper separations. More stages of contact provide more heat exchangers as well as more interphase material exchangers.

At the present state of our knowledge of hydrocarbon fractional distillation it appears that material transfer is controlling as far as plate efficiency is concerned and that any plate that satisfies the interphase contacting requirements will also be satisfactory from a heat transfer point of view. It does not follow, however, that this also applies to other hydrocarbon separation processes, such as extractive distillation where the interphase material transfer driving force has been increased by the use of a solvent.

From the above it can be appreciated that the efficiency of any contacting device depends upon both heat and material transfer capacity and of course upon the physical and thermodynamic properties of the fluids.

If the vapor flowing up a bubble plate column should channel with cross flow of the liquid, an unbalanced condition can result where the vapor near the overflow weir does not get cooled as effectively as the vapor near the inlet weir. Likewise less interphase material transfer will take place. This unbalanced situation may be further aggravated by a dis-proportionately large vapor flow up thru the caps near the overflow weir due to a lower liquid seal resulting from a high liquid gradient across the tray. Harrington, et al. (39) discussed this situation in a recent article.

The stage aspect of the bubble cap tray as compared to the differential aspect of packing must be considered in any comprehensive study of fractionation. In a truly counter-flow tower with uniform vapor and liquid distribution, the interphase material transfer driving force, i.e. difference between equilibrium and operating lines, remains uniform, changing gradually through the tower. Thus, the approach to equilibrium is uniform. In a bubble plate tower, consisting of a series of stages with each approaching equilibrium and with spaces between for distribution, the interphase material transfer driving force is not uniform in each stage. For a theoretically perfect stage, where the interphase contact time is sufficient to reach equilibrium, the driving force decreases to zero.

Concluded in next—the First June Issue

Union Oil Company Puts New Petreco Desalters on Stream

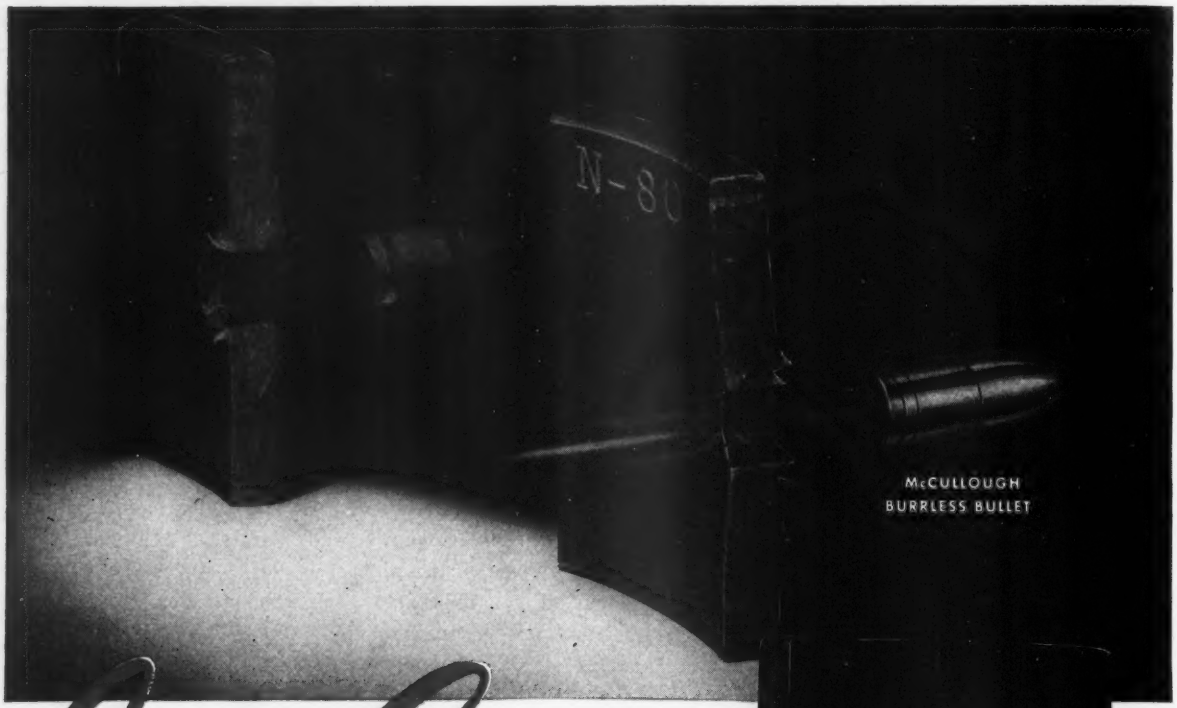
Three of the Petroleum Rectifying Company's latest design high capacity desalting units have been put on stream by the Union Oil Company of California at their Battles Station plant near Santa Maria. The new desalters process approximately 45,000 barrels per day of 15° A.P.I. Santa Maria Valley, Gato Ridge and Cat Canyon crudes.

The new desalting installation is the largest desalting plant in California. The three Petreco desalters are of a special high-capacity type developed for use wherever a large stream requires salt removal. This type treater has been extensively used in Eastern, Mid-Continent and Gulf Coast refineries for some years.

The installation of the Petreco high capacity desalters provides the Union Oil Company with one of the most complete crude oil conditioning plants in the industry today. The desalters take their charge from the clean crude coming into the station and the wet crude dehydrated by a battery of twenty standard Petreco Electric Dehydrators. The dehydrators bring the difficult treating Santa Maria Valley and Cat Canyon crudes down to pipeline B.S. and M. requirements from a wet cut of approximately 40%. The desalters then reduce the salt content to an acceptable refinery tolerance as specified by Union Oil Company refinery management. The entire plant features automatic controls and embodies the latest developments in the art of electrical dehydrating and desalting. Not only have the Union and Petreco engineers planned a model crude conditioning setup,—they have incorporated heating and flow features especially suited to the handling of 15° A.P.I. oil with the physical characteristics of the Santa Maria Valley crudes.

Hopper Canyon Well Rigs Pump

With hole bottomed at 3650 ft. and casing set at 2280 ft., Commander Oil Co., Ltd. is rigging pump to No. 8F in Sec. 13-4n-19w in the Hopper Canyon field, Ventura County.



Just Compare...

McCullough's BURRless BULLET!

...the first bullet to give both burr-free holes and full projectile efficiency. The unretouched photographs on the right–N-80 casing, 7⅝", 39 lb., perforated simultaneously by McCullough's BURRless Bullet and a regular bullet–show you more clearly than a thousand words that the McCullough BURRless Bullet gives you a perforation completely free from inside burr, eliminating the need for casing scrapers, preventing any possible damage to swabs or packers, saving you tool rental, saving you rig time, saving you money.

Another McCullough Special Service—no extra cost!

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CALIFORNIA: LOS ANGELES, AVENAL, BAKERSFIELD, SACRAMENTO, VENTURA, SANTA MARIA
LOUISIANA: HOUMA, LAKE CHARLES, NEW IBERIA, SHREVEPORT KANSAS: ULYSSES WYOMING: CASPER

EXPORT OFFICE: 30 Rockefeller Plaza, New York 20, N. Y.

Petroleum Equipment Suppliers Association Hold 12th Annual Meeting

The 12 Annual Membership Meeting of the Petroleum Equipment Suppliers Association was held in the Mark Hopkins Hotel, San Francisco, on May 4th to 7th inclusive. All of the five business sessions were well attended, and the response of those at the meetings to the various addresses, open forums, and busi-

A. B. Judd, Vice-Pres. and General Mgr., Republic Supply Co., Houston, Texas, and new Pres. of the Association.

Hugh H. Glen, Pres., Emsco Derrick & Equipment Co., and retiring Pres. of the Association.

Left to right—A. H. Miller, Bob Roberts, Frank Rehm, Gardner Blackman, and Ted Sutter.

"CBV" COMBINATION BALANCED VALVES
For Precision in Gas Regulation!

The right gas pressure with continuous control is a prime need supplied by the "CBV" type regulators. These are combination balanced valves built in two interchangeable styles—either offset connected or direct connected.

The offset model allows easy access to inner valve assembly through a hand hole plate. It does not require removal of the entire superstructure to examine or change the valve assembly. In changing from a high to a low pressure regulator, the diaphragm chamber unit is replaced and the rocker arm shaft is changed to a low pressure rocker arm shaft. The offset connected style has a fulcrum between the diaphragm and valve assemblies.

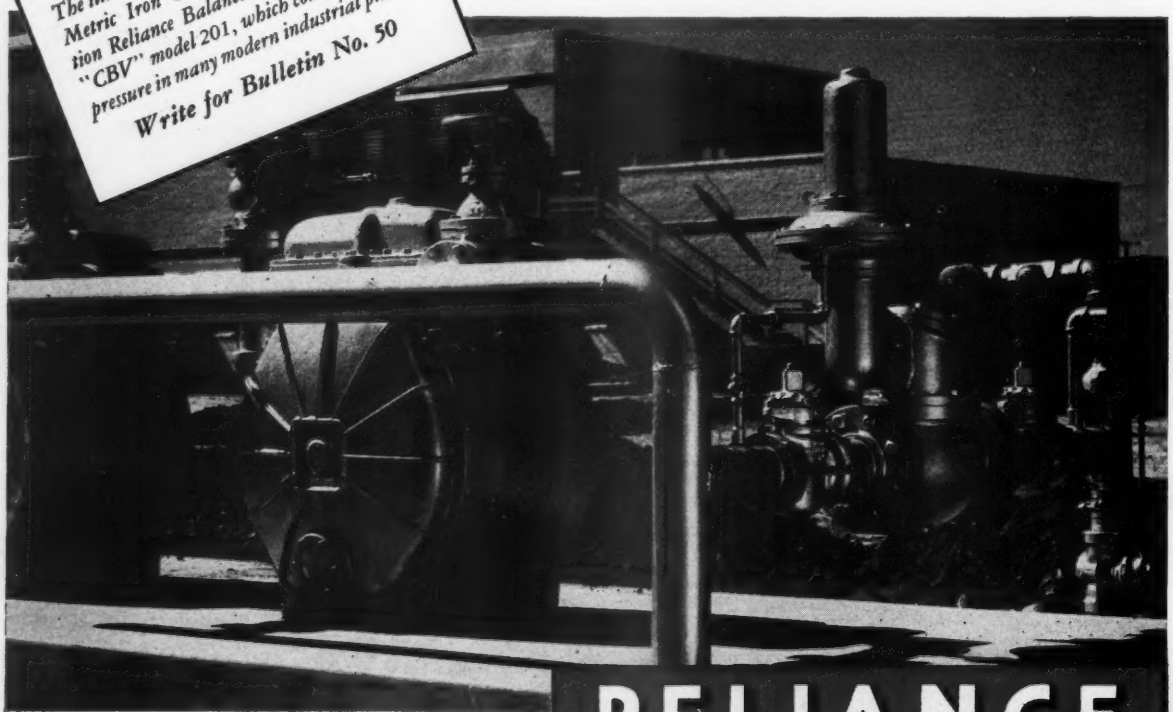
In the direct connected regulator, the diaphragm assembly is connected straight through to the valve assembly. It comes in three optional types: the high pressure weight-loaded; spring-loaded; or pilot-loaded. This model also has interchangeable parts which permit switching to a spring or pilot-loaded assembly. The change is made by replacing the pressure lever cap with the spring housing unit or with the pilot cap. These quick and easy changes help to meet new needs and specifications.

Both offset and direct connected models are offered in high pressure weight-loaded, spring-loaded, or pilot-loaded types. Low pressure models are pilot-loaded or weight-loaded, either inside or outside weights being available. Semi-low pressure regulators are made in pilot-loaded or outside weight-loaded types. The low pressure and semi-low pressure regulators are offered only in the offset style. A 3.4 to 1 ratio is maintained to provide better lock-up under low pressures.

Valve body castings are the same for either high pressure or low pressure types. A free flow of gas is provided at the point of expansion and body friction is reduced to a minimum. Directional flow arrows are cast into both sides of valve body castings for the user's convenience.

The illustration below shows an American Metric Iron Case Meter and combination Reliance Balanced Valve Regulator, "CBV" model 201, which controls the gas pressure in many modern industrial plants.

Write for Bulletin No. 50



American Meters

RELIANCE REGULATORS

RELIANCE REGULATOR CORPORATION
1420 MERIDIAN AVENUE, ALHAMBRA, CALIFORNIA

Left to right—A. B. Rysley, R. Schell, R. M. Morrison, R. D. Hilborn, and J. H. Lollar, Jr.

ness sessions was enthusiastic. Total registration was approximately 200.

On Monday, President Hugh H. Glen convened the first meeting, and after his opening remarks, the President appointed a Special Finance Committe instructed to study the financial situation of the Association.

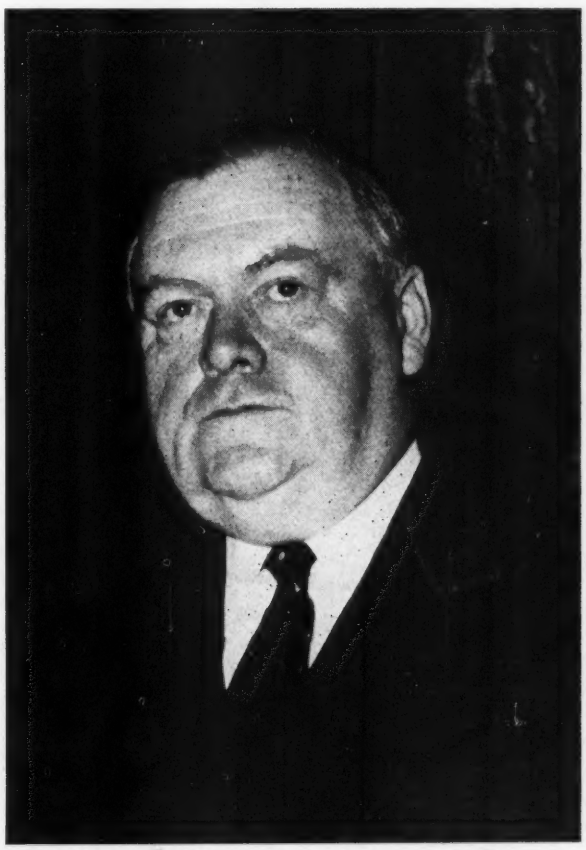
The meeting was then turned over to the Executive Secretary who introduced the members of the Panel, who were to conduct the Open Forum on Sales Accounting Procedures.

On Monday afternoon, President Glen convened a special meeting for the purpose of discussing labor relations.

The meetings on Tuesday were devoted to a talk by Mr. Don Gilman, Executive Vice-President, Western Oil & Gas Association, on the subject "Public Relations On The Part Of Trade Associations". Mr. Ray Dudley, President, Gulf Publishing Company, also spoke on "The Frequency of Publication of the Composite Catalog".

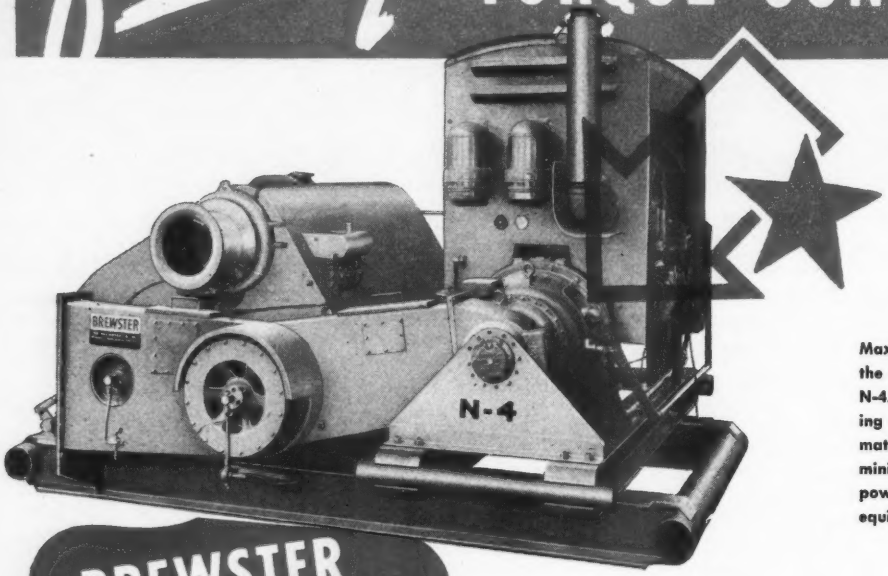
The Wednesday meetings were in the nature of general membership meetings to discuss and vote on officers and directors for the coming year.

A. W. McKinney, Vice-Pres., National Supply Co., Toledo, Ohio, and newly elected Vice-Pres. of the Association.



Frank Rehm, Vice-Pres., Industrial Relations and Personnel, Shell Oil Co.

Featuring THE POWER-SAVING TORQUE CONVERTER

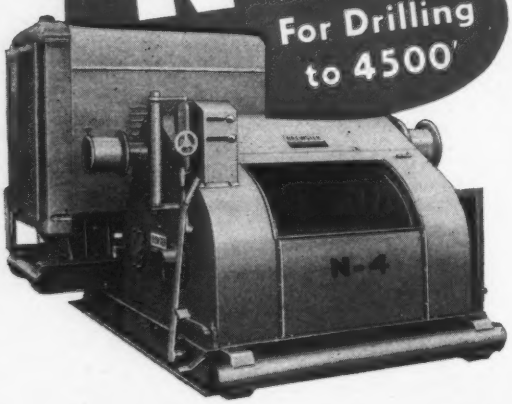


Fluid Drive Torque Converter

Maximum efficiency is assured with the fluid drive torque converter on the N-4. No power wasted in any drilling job—the torque converter automatically supplies top power with minimum engine effort. Safeguards power unit—reduces wear of other equipment.

BREWSTER N-4

For Drilling to 4500'



- **Air-operated Controls**
- **Unitized on Single Skid**
- **Centralized Control Panel**

Here's a small rig with all the big rig features—the Brewster N-4, designed for drilling to 4500'. Write for complete information—today!

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For Over 30 Years Manufacturers of Crown Blocks, Traveling Blocks, Oilbath Swivels, Oilbath Rotaries, Unitized Drawworks, Winches.

Field Development

PREPARED FROM CALIFORNIA OIL WORLD NEWS SERVICE

Los Angeles Basin

Lawndale Schist Explorer Listed

In the Lawndale field, south of Inglewood, Seaboard Oil Co. has location staked for Johnson No. 1 in Sec. 17-13s-14w, which is designed to interrogate the production possibilities of the schist formation.

Wells producing in the field tap oil sand between 5400 and 5800 ft. Union Oil launched a deep test in the area 18 years ago. This project went to 6460 ft., before abandonment due to mechanical trouble.

Inglewood Test Keeps Going On

Basin Oil Co.'s City of Inglewood No. 1 in Sec. 28-2s-14w on the northwest edge of the Potrero structure in the Inglewood area continues to drill ahead at 8770 ft. Macco Corp. and Ronald C. Smith's Macco-Smith No. 10 in Sec. 7-2s-14w is fishing drill pipe, top of which is at 7483 ft. The well went originally to 8473 ft., before redrilling to 8150 ft.

West Newport Active Center

Amerada Petroleum Corp. is rigging to pump Holtz No. 45-7 in Sec. 7-6s-10w in the West Newport area, Orange County. Total depth is 5550 ft., with casing set at 5435 ft. Farnsworth No. 46-7 in the section has been spudded and is running surface casing to set at a point near present bottom of 760 ft.

California Exploration Co., which already has several producing wells in the area, is ready to skid rig to location of Cagney No. 1 in Sec. 28-6s-10w. Republic Operators, Inc., Newland No. 1 in Sec. 12-6s-11w is still a location. The company's Terrace Comm. No. 1 in Sec. 16 is making hole at 4063 ft. This project lies between the so-called hogback and Costa Mesa.

D. D. and Dorothy Dunlap have completed Aldrich Land Co. No. 4 in Sec. 19 for 95 barrels of oil a day. No. 6 is drilling at 3110 ft. No. 7 is a foundation.

The widening drilling campaign at West Newport was set off by George Atha, producer and geologist, who found new oil in the area two years ago, following an extensive geological study.

Antelope Valley Wildcat Drilling

Willette Oil Co., Virginia Lee No. 1 in Sec. 20-5n-9w in the Palmdale area of Los Angeles County is exploring ahead at 3423 ft. Open 20 minutes, formation test of the interval 3143-3384 ft. recovered 3000 ft. of fresh water. Amapola Oil

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REDRILLS, OLD WELLS . . .
I WAS SURE THEY HAD TO REDRILL TO GET OIL OUT
SAVE DRILLING MONEY FOR NEW WELLS!
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COST OF REDRILLING SAVED WITH HI-PERM
Another outstanding job with Hi-Perm—A well whose production was so considerably increased by HI-PERM chemical treatment that redrilling plans were dropped. The well had already been scheduled for redrilling when HI-PERM was recommended. Two months after treatment, production had settled to an increase of over 100%. Such increases are not uncommon with this new chemical treatment. Before you redrill, try HI-PERM and save your drilling money.
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Corp.'s No. 1 in Sec. 6-6n-12w not far from Lancaster is standing idle at 1750 ft.

Dominguez Try Swabs

After setting bridge plug at 10,457 ft., Union Oil Co. is swabbing water and oil from Hellman No. 58 in Sec. 27-3s-13w in the Dominguez area. Total depth is 11,330 ft.

Standard Sponsors Basin Exploration

Standard of California's Boobier No. 1 in Sec. 15-4n-17w near the Del Valle field is digging at 6845 ft. German Comm. No. 1 in Sec. 11-3s-11w in the Leffingwell area is drilling at 9526 ft.

Orange County Combing For Oil

Orange County currently is being combed for new oil in a number of sectors.

In the Placentia area, Tide Water Associated Oil Co. is making hole ahead at 6128 ft. with Placentia Comm. No. 12-1 in Sec. 30-3s-9w. Royalty Service Corp., Ltd., H. B. No. 1 in Sec. 36-3s-10w is prospecting on down at 5380 ft.

Morton and Sons' No. 174-1 in Sec. 10-6s-8w in the El Toro area is down 3796 ft. Irvin Subdn.-Irvine No. 55-1 in the Corona Del Mar area is making progress with the drill near 7800 ft. Rubicon Oil Company's Wilcox No. 1 in Sec. 6-4n-8w in Santa Ana Canyon last was reported making hole at 2166 ft.

Torrance Try Coring Schist

R. W. (Rocky) Jerman's Torrance No. 1 in Sec. 14-4s-14w in the Torrance field is coring in schist at 5725 ft.

Riverside Try Digging

Near Temecula in Riverside County, Palomar Petroleum Co. continues to drill ahead at a depth of 2530 ft. with Tyrell No. 1 in Sec. 13-8s-1w.

Alondra Park Test Rigging

H. C. Christie is rigging derrick to start the drill in Johnson No. 1 in Sec. 22-3s-14w in the Alondra Park area. British-American Oil Prod. Co., Park Comm. No. 1 in Sec. 22 is drilling at 6099 ft.

New Carbon Drilling Job

Cardox Western Oil Co. is planning to drill a carbon dioxide well in Imperial County. Location falls 396 ft. north and 2175 ft. west of the southeast corner of Sec. 3-11s-13e.

Athens Test Drills Deeper

Shell Oil Co., Inc., Athens-Poindexter No. 1 in Sec. 12-3s-14w in the Athens area is drilling at 4949 ft. U.S.L. No. 515-29 in Sec. 29-5n-7w at Loma Verde near the Oak Canyon field is repairing equipment. Present depth is 1979 ft.

MEN and ROPE

For 33 years Moses Fenech (beside large forming machine) has helped produce good rope in the Tubbs Mills.

In every stage of production it is a combination of MEN and ROPE that assures a product outstanding in its field. Nearly one hundred years of fine rope making experience stands behind the products of the Tubbs mills. When you specify Tubbs Extra Superior Manila to your supplier, you know that this combination of MEN and ROPE offers you a product that will give the maximum in wear, dependability and safety.

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San Joaquin Valley

Richfield Active In Valley Sectors

Richfield Oil Corp. has under way a number of interesting tests in San Joaquin Valley prospect areas.

In the Wheeler Ridge area, Wheeler Ridge-KCL-A1 in Sec. 20-11n-20w is rigging up. The deep hole in the Coles Levee field, C.L.-A No. 21-33 in Sec. 30-30s-25e, is producing an unestimated amount of crude oil, following completion at 14,003 ft. in the Lower Stevens. Frank Buck No. 1 in Sec. 6-27s-21e in the Lost Hills area has reached 7685 ft. in gray sand and shale. Top Temblor gray sand was placed at 7592 ft. Belridge No. B-2 in Sec. 21-27s-20e on wildcat ground in the North Belridge area is drilling at 8618 ft. Berry No. 1 in Sec. 30-28s-21e in the South Belridge area has suspended operations at 10,034 ft.

McClure Test Building Rig

Approximately four miles west of the Pyramid Hills field, Group Operations, Inc., San Francisco, is building rig for Avenal No. 1 in Sec. 15-24s-17e in the McClure Valley area, Kings County.

In unproved territory near the Pyramid Hills field, Ridge Petroleum Corp. is spot coring at 1525 ft. with No. 13 in Sec. 17-24s-18e. Guaranty Sales, Inc., Corehole No. 3 in Sec. 8-24s-18e is going down at 2600 ft.

Lost Hills Test Starts

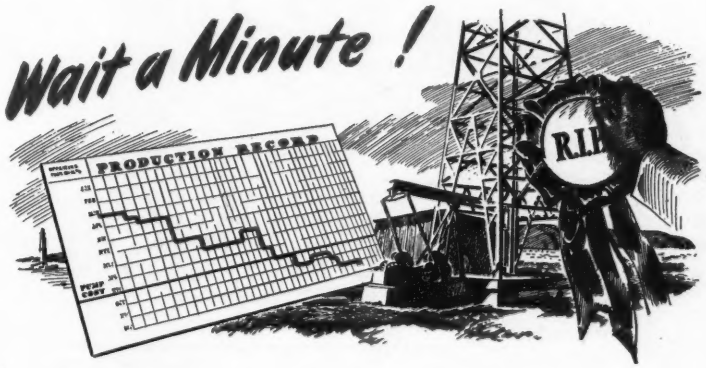
Universal Consolidated Oil Co. has staked location for No. 18, a shallow test in Sec. 30-26s-21e on the west flank of the Lost Hills field. Successful completion of a commercial well at this drill site would prove up a number of new locations.

The company's Derby No. 2 in Sec. 15-31s-29e in the Mountain View area is pumping clean 32.7 gravity oil from 6600 ft. On a 15-hour gauge the well made 78 barrels.

Sauerdough No. 13 in Sec. 23-29s-21e in the Cymric field is plugging to whipstock over for the Oceanic zone, absent on the way down to total depth of 5314 ft. in Point of Rocks oil sand. The latter evidently failed to produce.

McKittrick Testing Area

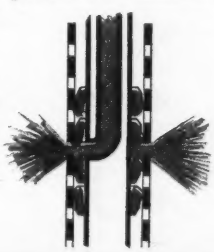
South of the McKittrick field, Texas Co. is grading ground for Westpet NCT One No. 57-29 in Sec. 29-30s-22e. Tulare NCT One No. 28-28 in Sec. 28 is standing with casing cemented at 6410 ft. Drilled to a bottom of 6548 ft. the well on formation test of the interval of 6303-6332 ft. recovered oily mud. Wilshire Oil Co., meantime, has staked location for McKittrick No. 3 in Sec. 12-30s-21e. E. A. Parkford's Parkford-McKittrick No. 1 in Sec. 22-30s-22e is testing. Total depth is 7743 ft., with plug at 5903 ft. Victor Exploration Co.'s No. 1 in Sec. 32-29s-22e is a rig only.



High-Pressure Washing may bring that "dead" well *back to life!*

Before you abandon that well which no longer pays its pumping cost, read and consider this statement of fact:

Time after time, operators in almost every California oil field have called in McGaffey-Taylor to wash supposedly dying wells: in a high percentage of cases, the use of M-T Pressure Washer has turned those "dying" wells into profitable producers—some of them producing even more than when they were first brought in.



To get the full story on *how* and *why* the McGaffey-Taylor Pressure Washer is able to remove the hard-packed material which gradually strangles a well,

Write for NEW Well Washing Bulletin, or ask a representative to demonstrate transparent model.

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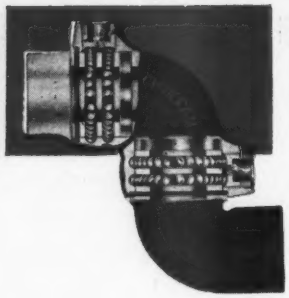
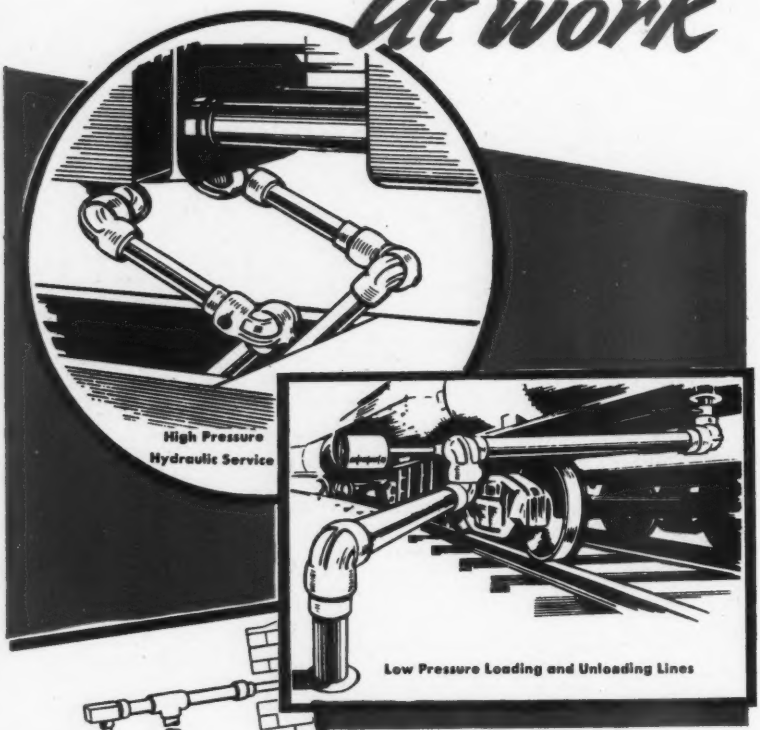


BALL BEARING SWIVEL JOINTS

At work



Look around you and you will see CHIKSAN *Ball-Bearing* Swivel Joints at work in many different applications ... from low pressure loading and unloading lines to high pressure hydraulic equipment and under high temperatures on boilers and open hearth furnaces. CHIKSAN Swivel Joints are made in over 500 different Types, Styles and Sizes... for pressures from 300 psi to 12,000 psi and temperatures to 500° F... for full 360° rotation in 1, 2 and 3 planes... with threaded or flanged ends or bored for welding. Write for CHIKSAN CATALOG No. 45.

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CHIKSAN BALL BEARING SWIVEL JOINTS FOR ALL PURPOSES

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Belridge Well On Bailing Test

Bailing to test McClure shale between 2690 and 3300 ft. is Belridge Oil Co.'s No. 62-W-33 in Sec. 33-28s-21e in the South Belridge area. The project was originally designed as a deep test and was carried to 14,107 feet.

Edison Test Well Listed

Three miles north of the Edison field, Caliente Oil Co. is rigging Cohn Estate No. 1 in Sec. 12-30s-29e, designed to seek oil in the Schist. West of Edison production, Union Oil Co. is drilling at 1935 ft. with Smith No. 63-28 in Sec. 28-30s-29e.

Temblor Try Scheduled

Cal Oil & Gas Co. has location staked for Cal No. 2 in Sec. 25-29s-20e in the Temblor area, Kern County. No. 1 was given up at 3246 ft. as a duster.

San Emigdio Job Inactive

Continental Oil Co.'s L-1 in Sec. 11-11n-22w in the San Emigdio area continues to remain dormant from an active operational standpoint. Depth is 10,424 ft.

Midway-Sunset Project Tests

Testing uphole by stages is the present routine at General Petroleum Corp.'s Frankley No. 77-17 in Sec. 17-11n-23w in the Midway-Sunset area. Total depth is 5019. Salt water was swabbed from perforated intervals at 2215-2175 and 2125-2005 ft. Salt water with a scum of oil was swabbed above plug at 2155 ft.

Round Mountain Lists New Try

Morton and Kohlbush are ready to begin work on Ogier Comm. No. 1 in Sec. 15-28s-28e in the Round Mountain area. Alma No. 1 at last reports pumped at the rate of 25 barrels of 12 gravity daily, cutting 83 per cent.

Coastal and Northern District

Goleta Wildcat Starting Work

Returning to the scene of an earlier test well, Ohio Oil Co. has started work on Thomas B. Bishop Co. No. 1 in Sec. 31-5n-28w in projected Sec. 7-4n-28w.

The company's first test, known as Prevedello No. 1 in Sec. 1-4n-28w, went to 3266 ft. before giving up last August. Showings were encountered at approximately 2900 and 3100 ft.

Cat Canyon Lease Taken

Foxen Ridge Oil Co. has obtained 200 acres of the Wickenden Rancho in Sec. 33-9n-32w near Cat Canyon. Two old wells on the property will be deepened from 4600 and 200 ft., respectively. Dan Fisher is president of the concern.

Montalvo Adds New Prospect Job

Standard of California has stepped out about a mile from its discovery well in the Montalvo area of Ventura County and is grading location for Maxwell No. 1, approximately 1975 ft. south and 100 ft. west from the northeast corner of Sec. 23-2n-23w. McGrath No. 65-3 in Sec. 30-2n-22w is drilling at 2761 ft. Surface casing was cemented at 1450 ft.

Oxnard Well Rigging Pump

On the Oxnard plains, O. L. Riley Co. is rigging to pump Hi Ko No. 1 in Sec. 5-1n-21w. Total depth is 2815, with casing cemented at 2446 and tubing hung at 2445 ft. The well blew some gas and oil while rods were being run.

Humboldt County Wildcat Starting

M. M. and O. F. Fowler have location staked for No. 1, a wildcat test in Sec. 15-3n-1w in the Eureka area of Humboldt County. W.C.M.C. Oil Co., Inc., Mathew Clark No. 1 in Sec. 21-1s-2w near Petrolia is still idle at 2025 ft.

Winters Gas Try Making Hole Ahead

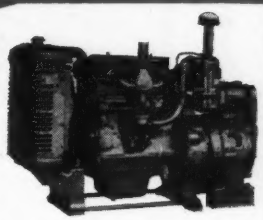
In the Winters area in Solano County, Shell Oil Co., Inc., is drilling at 2220 ft. with Szekeres No. 1 in Sec. 19-8n-1e. Standard's Solano County gas test in the Kirby Hills in Sec. 15-4n-1w has been spudded. It is located on the Scally Estate.

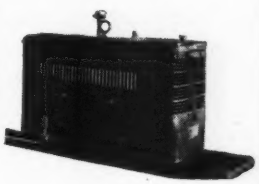
Conejo Project Gun Perforates

With casing cemented on bottom at 670 ft., Joseph Schuck is ready to gun perforate his No. 1 prospect job in Sec. 33-2n-20w in the Conejo area, Ventura County. Union Oil Co. found oil in the area as far back as 1892.

The Electric Power Unit with the BUILT-IN WATCH DOG

INTERNATIONAL-PALMER
ELECTRIC POWER UNITS





have a built-in safety feature—the Palmer Self-Regulating Alternator, which holds its voltage from no load to full load within 2% plus or minus at unity power factor, has high starting torque and high efficiency (will carry 25% overload 4 hours without overheating), and requires neither voltage regulators or switchboards. Electric motors can be started up to full rating of alternators. For International-Palmers, with skid bases and hoods, call —

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Piru Creek Test Drills

Bolsa Chica Oil Corp. continues to drill steadily ahead at 1520 ft. with Bolsa Chica No. 76-32 in Sec. 32-5n-18w near Piru Creek, Ventura County.

Union Spuds Nipomo Test

Union Oil Co. has spudded Vernon Wineman No. 2 in Twp. 11n, Range 33w in the Nipomo area, San Luis Obispo County, and at last reports was down 265 ft. The company is grading ground for Henderson No. 1, a prospect job in Sec. 23-3n-21w in the West Mountain area, Ventura County. Location has been staked for C.D.L.B. in Sec. 32-3n-12w at Simi.

Zaca Creek Try Redrills

Redrilling at 2729 ft. was the latest word from Tide Water Associated Oil Co.'s Quati No. 75 in Sec. 34-8n-31w in the Zaca Creek area near the Gato Ridge field.

Standard Oil Co.'s Magenheimer No. 541 in Sec. 9-9n-32w, and Tognazzini No. 348 in Sec. 15-8n-32w are standing idle at 4100 and 4012 ft., respectively.

West Mountain Well To Pump

After swabbing muddy water with a trace of oil and gas, Ring Oil Co., Synd., is preparing to pump S. P. No. 1 in Sec. 23-3n-21w at West Mountain. Total depth is 5592 ft., with casing set at 3758 ft. Los Nietos Co. and Lucy Smith Battson have location for C. & H. No. 4 in the section. D. D. Feldman is making hole ahead at 3751 ft. with Richardson Estate No. 3.

Cat Canyon Test Going

General Petroleum Corp. is drilling at 4676 ft. with Dominion No. 41-14, a test in Sec. 14-9n-33w in the Cat Canyon area. On formation trial of the interval of 4375-4470 ft., open 37 minutes, recovery was made up of 80 ft. of drilling mud.

In the proved area, Douglas Oil Co. has finished Los Flores No. 1 in Sec. 22-9n-33w, pumping 350 barrels a day from 6230 ft.

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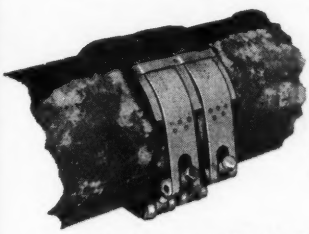

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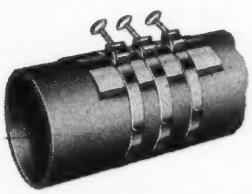

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Yolo County Gas Try Digs

Texas Co., Dunnigan Unit One No. 2 in Sec. 26-11n-1w is digging at 3740 ft. Drill site is in the Dunnigan Hills, not many miles from where Standard has made location for Giguere No. 1 in Sec. 7.

Monterey County Well Wet On Test

Shell Oil Co. Inc., Honolulu-Thorup-USL No. 1 in Sec. 4-20s-7e near King City in Monterey County swabbed wet on test. Total depth is 6777 ft., with plugged back depth, 4626 ft.

Arroyo Grande Starts New Wells

Adams Oil Co., which is bailing from 1127 ft. in its Dollie 7, is rigging Dollie No. 8 and has location made for Dollie No. 9. All locations are in Sec. 6-32s-13e in the Arroyo Grande field, San Luis Obispo County.

Ventura Avenue Project Redrills

Lloyd Corp., Ltd., L. C. No. 20 in the Ventura Avenue field is redrilling at 12,195, ft., after going originally to 12,935 ft. L. C. No. 16 is a foundation. L. C. No. 22 is rigged.

Tide Water Associated Oil Co. is drilling at 3166 ft. with Lloyd No. 146. Lloyd No. 142 is grading. Shell Oil Co., Inc., Shell-Lloyd No. A-2 is a rig.

Orcutt Wildcat Nears Completion

Sunray Oil Corp.'s Los Flores No. 1 wildcat test in Sec. 4-8n-33w in the Orcutt area is reaming to set casing on bottom at 5658 ft., preparatory to cementing through perforations at top of Chert zone at 5270 ft.

Kettleman Redrill Job

Standard of California is preparing to redrill No. 73-30V in the Middle Dome wildcat sector of Kettleman Hills, which found new oil in the Eocene formation. Original depth is 12,389 ft., with bridge at 7644 ft. U.O.N.P.R. No. 42-33R at Elk Hills is standing with 7-in. casing cemented at 2680 ft. Total depth is 3320 ft. U.O.N.P.R. No. 366-32S is coring near 4900 ft.

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Coalinga Well Going On Pump

Having been swabbed and flowing by heads, Sharples Oil Corp. plans to put on the pump Hyde No. 1 in Sec. 6-19s-16e in the northeast Coalinga area. Plugged back depth is 8316 ft.

Paloma Project Runs Blank Liner

General Petroleum Corp. has run and cemented blank liner at 12,226 ft. in Tupman No. 18-36, a northeast extension test of the Paloma field. Perforations will oppose the best of showings for normal testing. Total depth is 12,232 ft., with casing set at 12,226 ft.

Terra Bella Try In Offing

J. L. Smith and R. H. Larsen have joined forces and have sponsored a new wildcat test well in the Terra Bella area of Tulare County. Location for the well, Moore No. 1, has been staked in Sec. 28-22s-27e.

Cymric Wildcat Getting Deeper

Rothschild-Bender Oil Operations, Sheep Springs No. 8 in Sec. 17-29s-21e in the Cymric area is drilling ahead near 4300 ft. The Upper Carneros was stopped at 3636 ft., Main Carneros, 3737 ft., with base at 3910 ft. All zones apparently were gray.

Ten Section Hole Redrills

Shell Oil Co., Inc., KCL-A No. 30-30s-26e in the Ten Section field redrilling at 10,276 ft. Original depth is 13,745 ft. Guth McCaleb Comm. No. 1 in Sec. 12-26s-26e in the McFarland area is making hole ahead near 3000 ft.

Bacon Hills Project Digs

Seaboard Oil Co. is drilling Seaboard Bandini No. 3-21 in Sec. 21-28s-20e in the Bacon Hills area below 500 ft. This is a follow-up job to the discovery well, which is pumping daylights only at a rate between 50 and 75 barrels of 40.1 gravity oil daily. In the Panoche Creek area of Fresno County, ground is being graded for Lillis No. 85-26 in Sec. 36-15s-12e. Fuhrman No. 4 in Sec. 21-28s-28e in the Kern River area is rigging up.

Carneros Creek New Test Center

Carneros Creek in Kern County is the scene of a new test. Independent Exploration Co. has staked location for Anderson No. 1 in Sec. 29-28s-20e. Williams No. 1 in Sec. 31-27s-28e in the Poso Creek area is down 2730 ft. and running electric log.

Cymric Try Ends Search

Miller and York have abandoned as a dry hole their Merritt No. 1 in Sec. 29-29s-21e in the Cymric area. Total depth is 5005 ft. Carneros streaks were logged from 3395 to 3495 ft. Phacoides was reached at 4933 ft.

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California Oil World's Monthly Summary

DEVELOPMENT—PRODUCTION—SUPPLY & DEMAND
PACIFIC COAST TERRITORY

TABLE I—CALIFORNIA DEVELOPMENT—PRODUCTION

	MARCH, 1947 DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First 3 Months	Daily Average March 1947	Daily Average March 1946
SAN JOAQUIN VALLEY REGION						
Ant Hill	.....	.....	.....	1	1,560	1,277
Bellevue	.....	.....	.....	.....	303	428
Belridge—North	.....	.....	.....	.....	4,928	5,776
Belridge—South	2	8	244	15	9,941	10,947
Blackwell's Corner	.....	.....	.....	.....	199	223
Buena Vista Hills	.....	1	74	5	48,316	40,097
Canal	.....	.....	.....	.....	2,019	2,877
Coalinga Group						
Eastside	4	.....	.....	.....	15,705	17,801
Oil City	.....	.....	.....	.....	94	102
Coalinga—Nose	.....	.....	.....	.....	52,031	47,671
Coalinga—Northeast	.....	.....	.....	1	8,185	8,230
Pleasant Valley	.....	.....	.....	1	4,086	3,657
Jacalitos	4	4	744	6	3,995	4,903
Westside	.....	.....	.....	1	6,837	6,855
Coles Levee—North	3	1	1,179	1	16,184	15,190
Coles Levee—South	2	.....	.....	1	2,734	1,874
Edison	.....	.....	.....	6	11,863	14,275
Elk Hills	5	2	90	3	5,899	14,956
Fruitvale	.....	.....	.....	.....	6,706	7,996
Greeley	.....	.....	.....	.....	10,355	10,945
Helm	.....	1	219	2	4,388	3,927
Kern Front	3	1	56	7	9,045	8,577
Kern River	2	6	196	9	10,010	9,956
Kettleman North Dome	5	2	997	5	38,070	38,717
Lanare	.....	.....	.....	1	2,390	1,482
Lost Hills	3	11	585	28	4,680	3,576
McKittrick Group						
Cymric	1	1	598	14	13,770	5,559
McKittrick	1	.....	.....	.....	2,882	3,127
McKittrick Front	1	1	51	1	1,423	1,580
Phacoides	.....	.....	.....	.....	.....	.....
Salt Creek	2	12	2,657	24	5,371	202
Sheep Springs	.....	.....	.....	.....	357	510
Temblor Ranch	.....	.....	.....	.....	120	14
Midway-Sunset	4	9	867	15	42,898	41,407
Mt. Poso Group	2	.....	.....	.....	14,584	17,104
Mountain View*	.....	2	474	6	5,274	3,231
Paloma	9	2	339	9	8,083	5,044
Poso Creek Group	1	1	33	5	3,850	3,584
Pyramid Hills	.....	.....	.....	.....	262	436
Race Track Hill	3	2	195	2	2,123	1,226
Raisin City	.....	.....	.....	.....	2,616	2,473
Rio Bravo	.....	.....	.....	.....	12,699	13,717
Riverdale	1	.....	.....	.....	4,124	3,414
Rosedale Ranch	.....	.....	.....	.....	111	88
Round Mountain Group	.....	4	352	5	8,797	9,403
Strand	.....	.....	.....	.....	1,477	1,874
Strand—East	.....	.....	.....	.....	519	571
Tejon Ranch	2	2	312	7	3,007	948
Ten Section	1	.....	.....	.....	8,005	9,003
Union Avenue	.....	.....	.....	.....	344	282
Wasco	.....	.....	.....	.....	329	855
Wheeler Ridge	.....	.....	.....	.....	232	221
Williams	.....	.....	.....	.....	1,426	1,645
Other Fields	3	3	350	6	379	192
TOTAL—San Joaquin Valley Region	64	76	10,612	187	425,579	410,025
COASTAL REGION						
Santa Maria District						
Casmalia	.....	.....	.....	.....	246	253
Cat Canyon—East	.....	.....	.....	.....	420	747
Cat Canyon—West	3	6	2,100	11	11,164	7,452
Gato Ridge	.....	.....	.....	.....	3,551	3,845
Lompoc	1	5	889	15	4,165	1,290
Orcutt	2	1	134	8	4,215	3,561
Santa Maria Valley	2	6	497	12	28,443	34,737
Zaca Creek	.....	.....	.....	.....	384	391

	MARCH, 1947 DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First 3 Months	Daily Average March 1947	Daily Average March 1946
COASTAL REGION—Continued						
Santa Barbara District						
Capitan	.....	.....	.....	.....	2,885	3,478
Elwood	3	1	290	2	7,148	6,203
Santa Barbara	.....	.....	.....	.....	87	104
Summerland	.....	.....	.....	.....	2	8
Ventura District						
Padre Canyon	2	1	212	2	2,800	2,610
Rincon	.....	.....	.....	.....	4,176	4,709
San Miguelito	1	2	140	2	5,131	4,599
Ventura Avenue	8	3	963	13	46,355	46,771
North Santa Clara District						
Del Valle	6	.....	.....	5	8,116	6,213
Hopper Canyon	1	.....	.....	.....	167	109
Oak Canyon	.....	.....	.....	.....	1,599	1,898
Sespe Canyon Group	.....	.....	.....	.....	216	242
Temescal	.....	.....	.....	.....	582	676
Others	.....	.....	.....	.....	248	232
South Santa Clara Valley District						
Aliso Canyon	1	.....	.....	1	3,197	2,911
Bardsdale	1	.....	.....	.....	397	483
Newhall-Potrero	2	.....	.....	2	6,403	5,747
Oxnard	.....	.....	.....	.....	1,127	1,074
Shiells Canyon	2	1	21	1	1,040	1,405
South Mountain	1	1	528	3	4,797	3,121
Others	3	3	239	8	1,011	264
San Luis Obispo and Santa Clara Counties	.....	.....	.....	.....	27	70
TOTAL—Costal Region	39	30	6,013	85	150,099	145,203
LOS ANGELES REGION						
Brea-Olinda	3	2	296	9	11,831	10,653
Coyote—East	1	1	88	5	4,971	4,851
Coyote—West	2	3	592	7	15,585	15,527
Dominguez	2	.....	.....	5	15,448	16,951
East Los Angeles	1	.....	.....	1	907	473
El Segundo	.....	.....	.....	.....	472	606
Huntington Beach	2	4	500	12	49,660	46,035
Inglewood	2	.....	.....	.....	12,092	13,384
Long Beach	1	1	52	1	23,720	25,069
Montebello	.....	.....	.....	1	7,746	9,223
Newport	2	5	638	31	7,844	3,465
Playa Del Rey	.....	.....	.....	.....	2,101	2,376
Potrero	1	.....	.....	.....	886	1,009
Richfield	1	1	119	5	6,741	7,013
Rosecrans-Athens Group	.....	.....	.....	.....	4,694	5,111
Santa Fe Springs	.....	.....	.....	.....	16,417	16,635
Seal Beach	2	1	436	4	11,126	10,313
Torrance	.....	1	14	1	8,202	8,650
Whittier	.....	.....	.....	.....	980	1,036
Wilmington	17	17	5,442	46	125,220	97,056
Yorba Linda	.....	.....	.....	.....	214	176
Other Fields	2	.....	.....	.....	1,364	928
TOTAL—Los Angeles Region	39	36	8,177	128	328,221	296,540
EXPLORATORY						
Outpost Wells	20	.....	.....	.....	.....	.....
Wildcats	20	.....	.....	.....	.....	.....
Gas Wells	6	5	Gas	15	.....	.....
TOTAL CALIFORNIA	188	147	24,802	515*	903,899	851,768

*—Includes gas wells completed and 100 drilling wells abandoned.

With Drilling Contractors

Designed primarily as a builder of closer relationships between the many members of the various divisions, Drilling and Exploration Co., Inc., recently introduced Drilexco Cuttings, a house organ replete with interest from cover to cover.

The publication recalls that the California division began in 1933 as a one-rig organization in the Kettleman Hills field. This division, however, has grown to be the largest of the company's divisions devoted exclusively to contract drilling.

The first hole drilled was well No. 72-2-P in Kettleman Hills for the Kettleman North Dome Association and it was spudded on November 28, 1933.

A number of crew members and others employed at that time are still active in company operations. They include L. T. (Slim) Taylor, Lee Brumley, pushers; and C. E. (Barb) Jensen, Harry McMahan and Fred Burger, drillers.

J. E. Brantley, in addition to his executive duties as president of the company, acted as superintendent, engineer and drilling foreman during the initial operation. Earl Caldwell, editor of the company's publication, was in those earlier years warehouseman, timekeeper, paymaster and holder of half a dozen other posts.

It is interesting to note that the company's California division trains and furnishes most all of the American personnel required in its foreign operations. This phase of company activities is handled by the Los Angeles office. Ralph Marshall, California manager, after returning from one of his periodical visits to South American operations, observed that familiar faces at every Drilexco job and camp, gave him the feeling he was making the rounds of California work rather than in some foreign clime.

Current contract job of the company in California include Western Gulf's Paloma Unit No. 78-28, No. 32-34 and No. 34-34 in the Paloma field; Lloyd Corp.'s L. C. No. 16, No. 20 and No. 22 in the Ventura Avenue field; and Richfield Oil Corp.'s Beldrige No. B-2 in the North Belridge area.

The national annual meeting of the American Association of Oilwell Drilling Contractors set for October 13-15 at Long Beach promises to be the largest and most enthusiastic gathering in the history of the association.

E. C. (Ned) Brown, president of Brown Drilling Co. in Long Beach and vice president for California for the contractors association, came back from Tulsa with the news that directors of the national trade group had invited California to hold the next get-together.

Awake to the importance of the affair, Long Beach city officials, equipment manufacturers and other oil industry branches are cooperating with contractors in drawing plans for the 1947 meeting.

A number of committees have been named to handle various activities associated with the gathering.

The central committee is made up of Karl L. Kellogg, chairman, E. J. Simonis, D. H. Graham, E. C. Brown, Gene Reid and Ralph Marshall.

C. L. Fowler will handle transportation, D. H. Graham and F. A. York, publicity; program, Doc Hayes; registration, Gene Reid; finance, Ralph Marshall; housing, D. H. Graham; technical, Tom Pike; barbecue, J. E. Pettijohn; and entertainment, George H. McCarthy.

Clayton Severns of Severns Drilling Co. has become a grandfather and for the first time.

A bundle from heaven, a boy weighing seven pounds at birth, was recently presented to Mr. and Mrs. Joe W. Severns of Whittier. Joe is Clayt's son and a widely known member of the contract drilling business.

Rocky Mountain Drilling Co. is putting on the pump Sharples Oil Corp.'s discovery well in the Northeast Coalinga area. Among other company jobs are Standard of California's No. 73-30V at Kettleman Hills Middle Dome, No. 87-21-E at Jacalitos, McGrath No. 3 at Montalvo, and Six Co.'s Fee No. 1 at El Segundo; and Richfield Oil Corp.'s Berry No. 1 at South Belridge and Edison No. 2 at East Los Angeles.

Contract for drilling J. L. Smith and R. H. Larson's Moore No. 1 wildcat test in the Terra Bella area of Tulare County has been awarded to Gene Reid Drilling Co.

Contractor on R. W. (Rocky) Jerman's important schist test in the Torrance field is Atlantic Oil Co., which has several strings in operation at Wilmington and other state sectors.

One of the most interesting tests in the state is being drilled by T. P. Pike Drilling Co. on wildcat ground in the Del Valle area. It is Standard of California's Boobier No. 1, which is seeking new oil northeast of faulting. A successful well at this location would mark the first production on this side of structural displacement.

LeBow & McNee has the contract for drilling Trans-Oceanic Oil Co.'s M'divani No. 8, a scheduled deep test at the Santa Barbara Mesa. Trans-Oceanic is headed by David M'divani.

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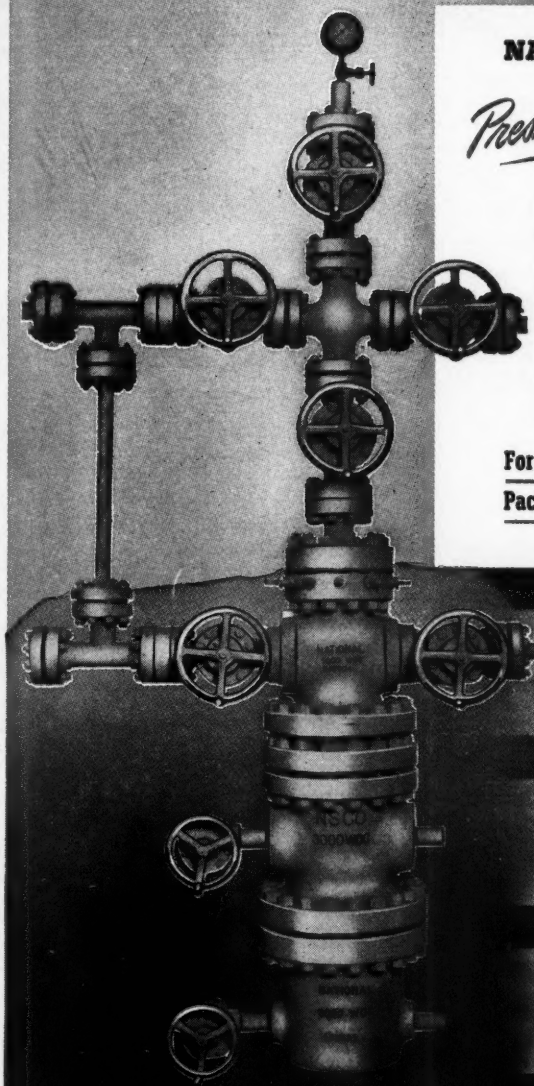


NATIONAL TYPE "B" Pressure Pack Well Head Equipment

National Type "B" Pressure Pack Well Equipment provides a modern full opening line of safe, dependable equipment.

Safe construction and modern design provides a flexibility of interchangeable combinations of size, capacity and type to serve individual well requirements. Slip and Mandrel Casing Hangers, Plain Crossover, Safety Crossover, Regular Safety and Plain Slip Weld Flanges are interchangeable.

For Complete Details of National Type "B" Pressure Pack Well Head Equipment. Write for Bulletin No. 313.

National Casing Head Type KHL-1—A simple unit designed to seal off a single string of casing in wells of medium depths and pressures.

National (Adjustable) Micro-Chokes—Type "D" Micro-chokes are of a thoroughly modern design and are used principally on high pressure wells.

National Type "A" Casing Support—Provides an economical means for supporting medium length casing string where no pressures are to be packed off outside the suspended casing.

National Type "W" Tubing Head—An extremely flexible unit designed to support a string of tubing and to seal it from the casing. It is for use for working pressures from 1000 to 3000 PSI.

NATIONAL BLUE PRODUCTS

THE NATIONAL SUPPLY COMPANY

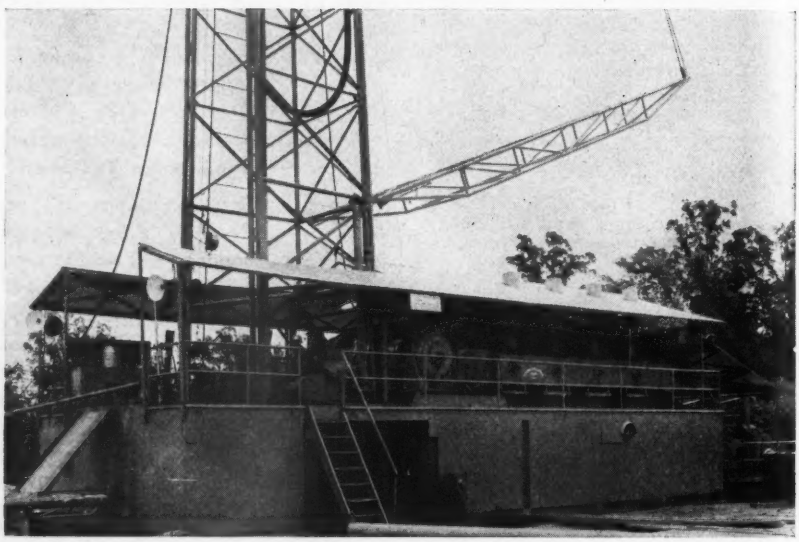
GENERAL SALES OFFICES: TOLEDO, OHIO · DIVISION OFFICES: CASPER · FORT WORTH
PITTSBURGH · TULSA · TORRANCE · EXPORT: NATIONAL SUPPLY EXPORT CORPORATION,
30 ROCKEFELLER PLAZA, NEW YORK, N.Y., U.S.A. · RIVER PLATE HOUSE, 12 SOUTH PLACE, LONDON, E.C.2.

Brewster Extends Sales and Service to Rocky Mountain and West Coast

Through the appointment of the Lee & Bryson Sales & Service Company of Long Beach, the Brewster Company are now prepared to render a sales and engineering service to the oil industry in the Rocky Mountain and West Coast areas.

C. T. Lee

H. S. Bryson



The N-10 drawworks is here shown on a special skid extended for mounting a 22-in. rotary and powered by four 200 h.p. engines driving through a chain box-type compounding system, with drives for two mud pumps. The four engines are compound mounted on a single skid and are moved as one unit. The Hydromatic Brake is cradle mounted on the substructure.—Drawworks, Transmission & Rotary move as one unit. 3 or 4 Engines & compound mounted on single skid move as one unit.

Two of the Brewster rotary rig drawworks are shown in the accompanying illustrations. The N-10 design is engineered for drilling to 10,000 feet with 4-in. drill pipe. This design, which is similar to a three-shaft steam-driven drawworks, is built with the drum assembly, 600-H.P. transmission and hydromatic brake mounted on a single

The compact design of the N-7 provides portability. Note the control panel for quick, easy operation.

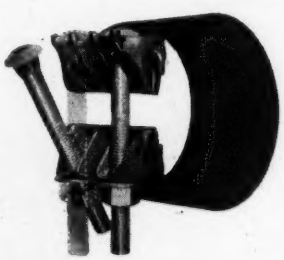
skid in a compact unit, easily moved and easily rigged up. The height of the shell is only 66½ inches and allows the driller a clear, unobstructed view of all operations on the rig. All clutches on the entire rig are air controlled, with all controls mounted conveniently in a single panel near the driller. All shafts, bearings, chains and moving parts of the transmission and in the rotary drives are oilbath lubricated by an oil pump. Only three roller bearings on the entire rig are pressure grease lubricated; all others are lubricated and cooled by oil circulated from the transmission. A four-speed transmission is provided with an automatic feature that prevents shifting from one speed to another while transmission sprockets are in motion. Sizes of all chains, bearings and clutches are selected for service utilizing 600 horsepower.

The N-7 drawworks for 7000-ft. drilling is a streamlined, compact assembly with transmission and drawworks built as a single unit. A four-speed, 400 h.p. transmission gives eight drum speeds. Among the features of this equipment are centralized control panel and air-operated controls.

The Lee & Bryson Sales & Service Company is headed by two well known equipment men—C. T. "Tut" Lee and H. S. "Sent" Bryson.

Stauffer Mfg. Co. Introduces Pipe Repair Clamp

The Stauffer Manufacturing Company announces the Stauffer Superior Pipe Repair Clamp which is for general use in the oil fields, refineries, and natural gasoline plants.



The clamp is constructed of duronze and manganese bronze which are practically non-corrosive in any type of installation. The band has a tensile strength of 89,000 lbs. per sq. inch and will not stretch under high pressures. It is not necessary to remove the nuts from the bolts when installing, due to the slotted lugs. Lug points hold bolts in position and prevent slippage. Only one wrench is necessary for complete installation. Neoprene rubber gaskets are furnished with clamps.

For descriptive literature write: Stauffer Manufacturing Company, 8424 Otis St., South Gate, Calif., or telephone the Company at LOgan 7390.

Emsco Issues New Booklet

The Emsco Derrick & Equipment Company have just issued a 4-page folder describing the new JV Series of Oil Field Swivels.

A copy may be obtained by writing to the Company, 6811 So. Alameda St., Los Angeles 54, California.

Micro-Netic Electric Boiler Feed-Water Controller

A new method of sensitively controlling feed-water for boilers, embodying powerful and positive magnetic action, has been developed by J. A. Campbell Company.

The product, known as the Micro-Netic electric controller, weighs only 7½ lbs. and can be attached to a boiler to occupy a space of 3½"x7½" for its housing and with a switch box measuring 2"x4"x6½".

The Micro-Netic embodies a round ball float of monel, capable of resisting a pressure of 400 lbs. p.s.i. This float carries a steel ring which attracts the magnets when the ring comes into their fields. Alnico permanent magnets are used, capable of lifting 100 times their own weight. A Micro-switch is used. When the level of water in the boiler lowers to a pre-determined point, the magnetic action starts the pump and when the level rises to a certain point, the switch is opened and the pump stops.

Literature describing the Micro-Netic may be obtained from J. A. Campbell Company, 645 East Wardlow Road, Long Beach 7, California.

New Bulk Station Pump Bulletin

A new bulletin on its line of Bulk Station Pumps has been issued by the Pump Division of Byron Jackson Co., Los Angeles, California.

Coded No. 46-7000, the four-page bulletin of descriptive data covers the "TLB" Pump, a centrifugal type pump, which is designed to handle gasoline, butane, diesel fuels, lubricating oils and other hydrocarbons for bulk station service.

Illustrated in three colors, a cross-section drawing shows construction and operating features. Other illustrations include a pump used to unload diesel fuel from tank cars into storage, and a cement company using a Type TLB to handle diesel fuel for its trucks.

A standard unit has a capacity range to 600 gpm, discharge pressure to 150 psi, temperature to 150° F. Special units are built for higher pressures and temperatures.

Copies are available at no cost from Byron Jackson Co., Pump Division, Box 2017, Terminal Annex, Los Angeles 54, California.

Long Beach Well Reaming

On the southeast flank of Signal Hill, Shell Oil Co. is reaming with Dolley No. 2, a deep test near the intersection of Hill and Obispo Sts. Bottomed at 10,119 ft., 7-in. casing is set at 10,119 ft. Water shut off was not considered conclusive. Heading flow was made up of oil and water, with the last cut about 25 per cent.

New Arvin Location

Western Gulf Oil Co. has made location for Di Giorgio No. 2 in Sec. 10-31s-29e in the Arvin area. The company's S. P. No. 1 in Sec. 25-12n-20w at Sand Hills is prospecting down at 10,675 ft.

Kern County OIL NEWS

KERN COUNTY FIELDS are all producing as much as they should. Purchasing agents are buying everything they can. There is a thirsty market. Looks like everybody is buying oil. Oldsters say they never saw such a crude demand.

HOWEVER, SOME ARE OVERBOARD with their production. They are reporting another area "over" the MER's . . . to make it four fields . . . in the San Joaquin Valley area. We were surprised to find the smaller boys leaping from the same springboard.

AND RIGHT ALONG this line production is way up over the figures turned in last year at this time for California. It's about 15%, but Kern County is up even more . . . because of its activity . . . and new ventures. Likewise it has more MER's in violation.

ALMOST UNDER THE SHADOWS that come from the steep hills which form Kern-River's banks over a thousand pioneers met in barbecue fashion this month. Hard by the area of Kern's Country Club was the first oil well hewned by man in Kern a half century ago. Here with hands and spade and bucket and windlass the pioneers laid bare the wealth that was to come.

SO IT WAS FITTING AND PROPER that the Petroleum Production Pioneers from far and near should meet back home on familiar soil . . . and common ground as it were. In Kern the name of Castro is also pioneer; and Charley's "meat" drove up in due time in his famous hearse to be devoured by a hungry thirsty crowd . . . turned out in numbers galore to see "POP" who helped make the industry. And the barbecue in Kern is ever good. In ten last years the constancy of the flavor and the tenderness of the meat have taken the guess work out of production . . . like the oilmen, action makes perfection.

OUT AT THE PICNIC we heard a lot of gossip. We found out a lot of stuff on and off the cuff. We took a lot of pictures . . . everyone knows each other so why bother with captions. We heard that bonuses were being paid in advance of the drill pipe on new locations so great is the need for oil. We heard about McKittrick and Mountain View recently breaking over the MER's and the gentlemen's agreement code. We heard that a new well came in the Kern River area near the Orloff tract making a 100 bbls. We heard incidently that Sam Orloff of Orloff Manor nearby, formerly of Taft Supply Company was gravely ill. Since then we have heard that one of our pioneers passed on. But the news was more cheerie on the whole.

SOMEONE TOOK OUR PICTURE. Don't know who it was. There must have been a hundred cameras. Tin cups were being held outward by many hands but none was blind . . . that is not entirely . . . at least no coins were dropped. It was the swankiest barbecue we have seen this side of Coral Gables in Miami.

LINED UP ON ONE BEACH were GP's Neil Needham (that's Mahdeen spelled backward) . . . he had his hat on. We don't know if he uses it or not. And then Fred Owen of Ethel D. (Kern County Bank to us) and Press St. Clair. Here is what Fred ball-penned us when he saw the proof of it through means of our speed graphic, "how come you picked three of us who have worked for our own respective organizations for more than 40 years without being fired. As of May 3, three of us total 45,177 days in California's oil industry, but in dollars we just couldn't even remember what happened to our last month's pay check."

FIFTEEN HUNDRED was the estimated number that attended the Petroleum Production Pioneers Club Bar-B-Q, according to Captain Roy Galyen, who ought to know his crowds from Highway Petrol experience. Most out of town attendance we ever saw to one of these barbequewigdigs. The local boys did a good job twice . . . getting the affair here and doing a good job out there by the river . . . park's country club. No one played any golf this time.

TRAVELLED: A. J. Heiser, field engineer for Oil Well Supply Company . . . to Oil City, Pa. . . . for a two weeks conference with representatives from other USA districts. "AJ" was once oil scout and engineer for Standard at Taft.

MARRIED: Ed Bowman . . . geologist for Standard of Taft . . . to Julie Hail, production engineering assistant for the same firm there . . . on March 22. Ed will leave in June to take his Ph.D. degree in geology at Harvard.

NOT TO BE OUTDONE by the Pioneer Oilmen's social function, the San Joaquin Valley Oil Scouts in spite of several counter attractions like API meetings and so forth shelled out at Shell park a week ago or so. Literally shelled out is right . . . because good stags stand and fall together in gin rummy or what have you before and after the "chow-do." Over 150 scouts took up annual evening picnic camp just across the Kern River Park at Shell Oil Company picnic grounds. . . . Only the shrill whistle of the tiny train and the caliope merry-go-round competed with the rippling Kern River at this point which helped to silence all other life around the snake eyes and chess. Morning . . . the dawn, and yawn

all day. No one was hurt but many are planning on getting even next year.

DON DAVIS was at the controls of the Scouts Outing . . . Castro barbecued as usual and the weather committee delighted chairman Don of Union Oil.

CHARLEY LAKE of Western Oilfields Supply (WoSco) had the misfortune of an automobile accident ten days ago when he and his wife were going to Santa Monica. Just passing through the tunnel on Sepulveda he met a careening car on the wrong side of the road. Mrs. Lake suffered a broken arm and Charley escaped with a number of painful bruises, cuts and a wrenched back. In talking with Mayor Jake Vanderlei, his neighbor, Jake told us that the people in the other car were possibly fatally injured. We have travelled with Lake considerably and this proves to us that no matter how carefully one drives there is a fool around every other corner or curve that has no respect for others. Lake is in our opinion one of the best drivers in the industry . . . he always said that he never took any chances at any time.

OLD MAN SUMMER has at last embraced Kern oilwigs everywhere here. It always gets cooler before it gets hotter and the accolade of caliente . . . its not due for another month. . . . So don't start bragging about how much hot we can stand.

MOST OF THE BAD NAME about Kern weather comes from home folks who are bragging about everything from homecooking to oil production. They always want to impress upon folks how healthy, how enduring is their makeup. Why even the slogan around Kern is "A Billion Dollars in Sunshine" . . . And by the by there are six other places as large as Kern where it is a lot hotter.

NON - TECHNICAL TELL TALES FROM TAFT are appreciated and we get four or five articles regularly from the nice lady we thought signed her name like an oilwig. Edison sent us poem, too. "An oilwig by the open derrick, He looks to the cores away, Under microscopic undulations, That are drilled in the month of May."

ROSS PHILLIPS, geologist for British American, was driving to Dunsmuir at the foot of old Mt. Shasta. Last time we saw him he was fishing for his health . . . not for oil.

OWEN "VALVE" JOHNSON always says the nicest things. Sometimes we are embarrassed . . . but it's nice to have people feel that way about it and mean it even if they don't know it . . . so we exchanged shots the last time out at the Pioneer Picnic. Owen has a new "valvewig" who joined his firm recently. . . . Still waiting for the house warming at the North Chester improvement on the shop.

THANX to L. PHILLIPS who related in some detail the other day about the Standard's Geological and Engineering pitnic at Capitol Park, Maricopa. Glen Ferguson was a guest and gave the pitch on the horseshoe throw. Evan Burtuer, Kenny Edwards, Jack Bauitau, Bert Ellison, Dick Reese and Bob Rist, geologists, were there as we remember her saying. Also with and

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Completely Automatic—Oil Heating Plants
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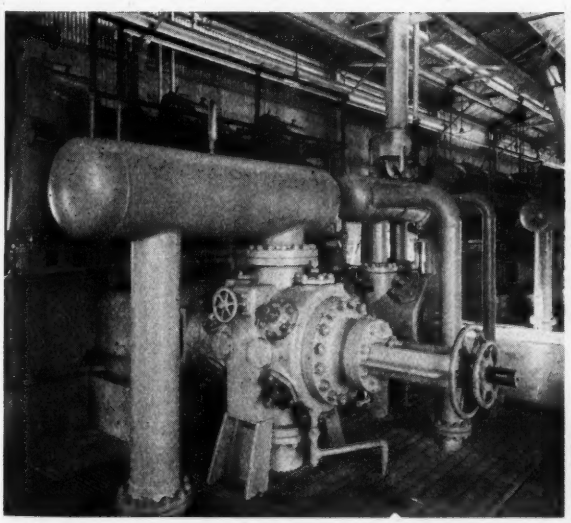

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Known for repair and sale of
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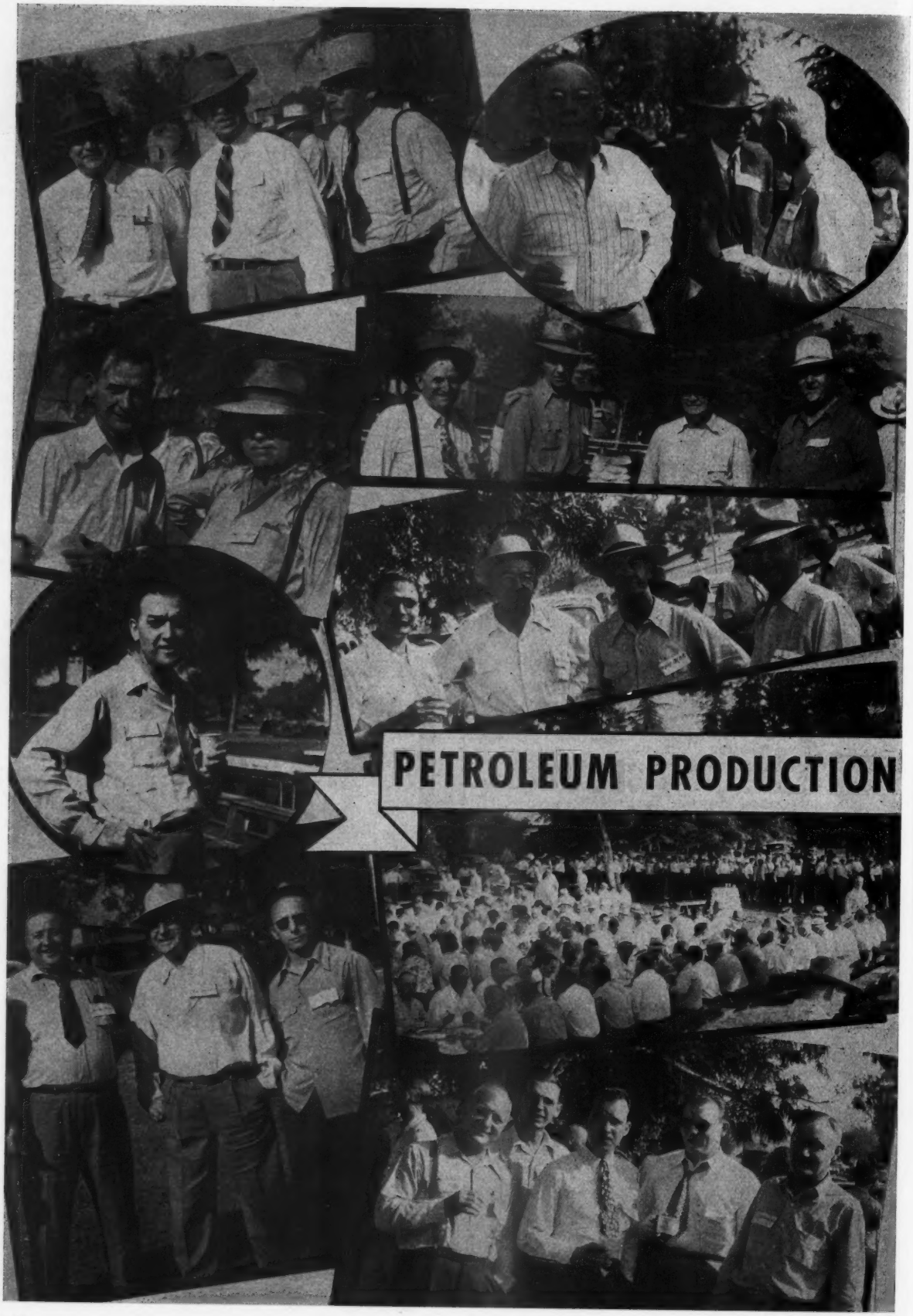
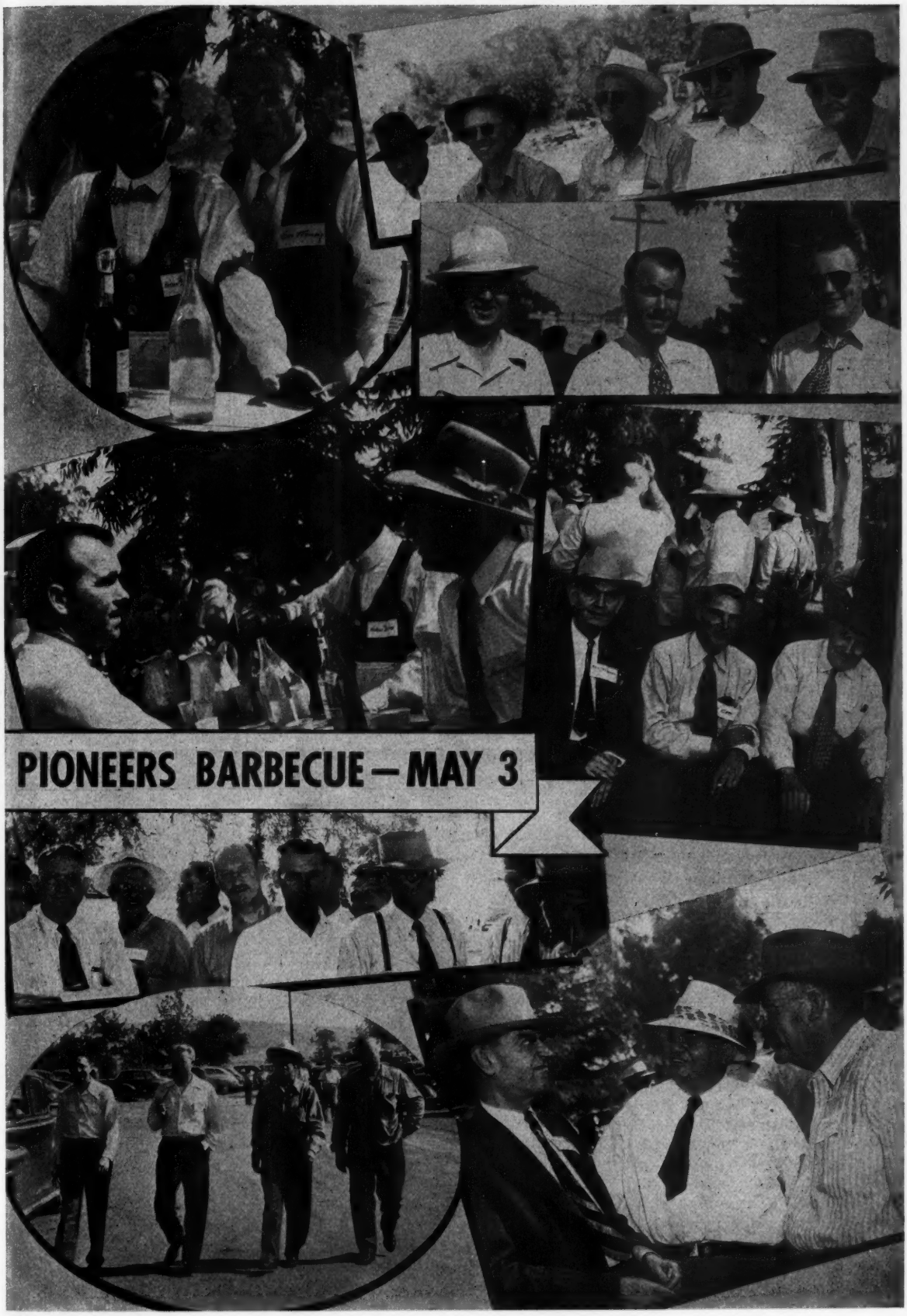

PETROLEUM PRODUCTION


PIONEERS BARBECUE—MAY 3

among the engineers were Jack Stewart, Don Moran, Ken Ward, Phil Crauer, Hoppy Hopper and others. Kenny Edwards also added Gil Pierce, Frank Carmelicle to the 45 that were present which he could remember seeing.

KERN OIL PEOPLE WERE saddened by news that Nora Grable passed away this month at Glendale. She was born in Glennville and her father was C. J. E. Taylor, one time county supervisor here. She served as Secretary to Rush Blodget, but before that was with George F. Getty Company and the State Mining Bureau. She was well known here and in California.

IMPORTING OF LOW GRADE CRUDES might lead to something according to Kern oil operators. They are not concerned over the 400,000 b/d now as long as the demand is way up . . . but most of us know what happened back in the late twenties and early thirties.

KERN MAY BE AN AGRICULTURAL county now but oil will produce the 1947 Miss Kern County and Taft people have their dander up as well as their money with odds that Miss Taft will win. Watch this space.

CHARLEY MANLEY of the Oil Field Construction Company is on an Eastern junket to cover about 9000 miles or more. Heading for New Orleans he expects to take a jaunt into Florida and fly to Cuba. From Miami he heads North to New York and Canada . . . be gone a month . . . probably he will have to hurry . . . and his mileage is going to be much higher.

LOCAL PRESS SCOOPS THE SCOUTS according to "damon oil trumer" . . . New well in Kern historic field came in by independent operators who say that 100 barrels a day was the check. The discovery is said to be a new rim to the old fields, and many little holdings hither and yon are being grabbed up for a song and some of the sharps are paying up old taxes. This is like buying your best girl a box of candy . . . you still have not reached the preacher, but it's a start in that direction.

KERN OILMINDED TOURISTS report that a sight to see is the five pipeline crews consisting of a 1000 men steming westward between Tucson and the desert area around Indio. They are building the California-Texas natural gas pipeline. The sight is colorful indeed with men who have built pipelines dispersed around the globe . . . during the war and before. Completion is anticipated by early December.

OILFIELDS TRUCKING COMPANY, the equipment with the sign of the Phoenix bird, is celebrating its silver anniversary. The Phoenix Brothers came to Taft in 1922 and started trucking with two transport outfits hauling products for GP . . . they pioneered the service. Today they have a million dollar business . . . they have branched out with exclusive franchises for oil to wayside areas in many states not served by a railroad. They also do highway building. . . . Of course, they use oil exclusively and its by products. Harry E. is the President, F. J, Treasurer, and P A., Vice President. Harry has his own plane and flies it . . . he lands and takes off anywhere . . . of course his bulldozers scrape off a spot.

ED PHOENIX, another brother, owns the State Transport Company. Harry told us the other day that he had a $2,000,000 highway job up the coast and that he planned on being busy for a while. So Kern County is really an example of how a truck driver can, if he wants to, better himself . . . particularly if he doesn't like his job.

SAM SELF, the man who makes and sells "soap," is about to do a little advertising so he told us down at the Mayfair.

DUNLAP WELDING AND BIT WORKS is another well known skilled and dependable service in Kern County run by "FAT" Dunlap, who tells us he has lost 18 pounds purposely on account of the summer coming up. He was talking advertising, too . . . he says the cost of doing business reflects volume and helps get more of it, he found out.

ART BRUMBLY has been telling us about the Medearis Oilwell Supply Company for whom he is supervising sales. And by the way he told us a very interesting story about himself as well as his oilwell packer. He mentioned drill pipe wipers, wire rope protectors and mud shakers. It made us think that the way some erstwhile speakers are throwing mud it might be well for someone to invent such a shaker for human usage.

A PETROLEUM PRODUCTION PIONEER just informed us that Sam Orloff who had been seriously ill died while under treatment in the South. Sam was a grand fellow . . . he made and lost several fortunes. He came to Taft as a junk dealer with a push cart . . . within just a few years he was President of the State Bank of Taft, which he founded. We all mourn his passing and our sympathy is tendered Mrs. Orloff, and the family. We know Maurice, Martin, Louis and Frank the best. Sam left them all in pretty good shape as he made them all his partners some time ago. Oil was recently located adiacent to his holdings here . . . in Bakersfield.

DESPITE THE FACT THAT everybody had a barbeque in Kern County the past month, "Ellery's Eatery" at the El Tejon still had a waiting line both luncheon and dinner with a back log for organization dinners from a month to ten months ahead. Since fixing up the new driveway it is possible to arrive in style and get settled before tag time by the local cops. Ellery says they started a bad habit of paying fines and it ran into so much that it was cheaper to improve the parkway.

R. E. (BOB) McCARTHY continues to get national publicity on his McCarthy Tank Company. He has been making concrete fabrications for housing and buildings . . . oilmen have to have warehousing and offices.

WE LIKE THE WAY UNION PACIFIC does our advertising for us. . . . The UP has a representative here and quite a few reefers are being filled with spuds right now. We always go UP when we travel back to the old country. The SP and Santa Fe have to help us out, however, as they (UP) is short on trackage in Kern County.

DOC CRANDALL of the California Exploration Company handed us his card the other day which shows him as Superintendent. Glad to know you, Doc.

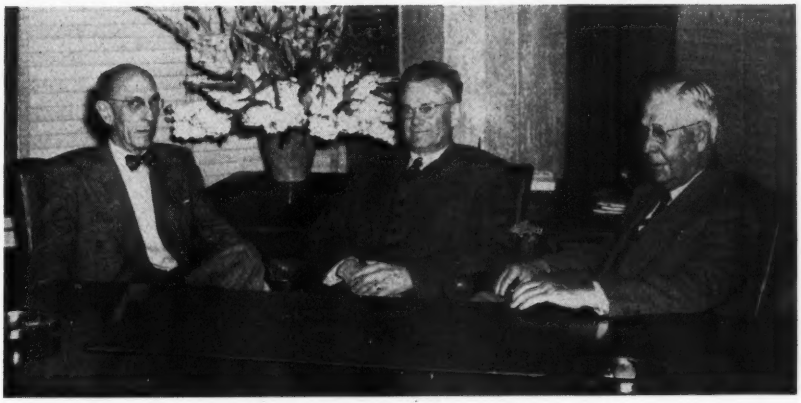
Personalities IN THE NEWS

App Honored by Predecessors

Three veterans of the oil industry, each of whom has been manager of production of General Petroleum Corporation gathered in the office of Max S. App, current occupant of that post, the other day in Los Angeles to celebrate Mr. App's 35th anniversary with the company.

Oddly enough, Mr. App, although youngest of the trio, has had more years of service than either of his predecessors.

Present for the occasion were Ben Parsons, App's immediate predecessor, who served 32 years prior to his retirement last January 1, and who was head of G.P. production for nine years, and the man whom he succeeded, W. L. McLaine. The latter, who retired January 1, 1938, was with the concern for 24 years, 17 of them in the position now occupied by Mr. App.



Ben Parsons, Max S. App and W. L. McLaine.

Miss Grace Muenk, retired, has the distinction of being the first woman annuitant from Shell Development Co. at Emeryville. She joined Shell Oil in San Francisco in June, 1920, as a stenographer in the engineering department. She went to work in Emeryville in 1928, shortly after the laboratories opened, as stenographer in charge of typing and assembling technical reports. In 1933, Miss Muenk was appointed secretary to S. Tymstra, associate director, the position she held at her recent retirement.

Waldrip Engineering Announces Additions To Staff

James Moon and B. P. Bayliss, formerly with Western Oil Tool and Engineering Company, and Dave Smith, formerly with Western Gear Works, have recently joined the staff of Waldrip Engineering Company.

James Moon is a graduate of the University of Wichita with a B.A. Degree in Aeronautical Engineering. From 1929 to 1931 he was in the Design Department of the Curtis Wright Airplane Company of Wichita, Kansas—from 1933 to 1936 was a Design Engineer with Cardwell Mfg. Company—1936 and '37 with Boeing Aircraft Company as Design Engineer—1938 to 1941 Design Engineer with Franks Mfg. Company—associated for a short time with Hillman-Kelley as Chief Engineer—later operated as an oil field consulting Engineer and became President of Western Oil Tool and Engineering Company.

B. F. Bayliss is a graduate Mechanical Engineer of Ohio State University and is a member of the American Society of Mechanical Engineers. From 1938 to 1941 he was an engineer in the Mechanical Engineering Department of the Shell Oil Company in the Mid-Continent and specialized in the development of portable "slim-hole" exploratory oil well drilling units. During the war he became a Lt. Colonel in the 4th Armored Division Artillery Service in the United States and abroad. From 1945 he was Vice-President of Western Oil Tool and Engineering Company.

Dave Smith was educated in California Technical Schools where he graduated in Electrical and Mechanical Engineering. In 1915 he joined the engineering staff of The National Supply Company. From 1924 to 1945 he was in the engineering department of Emsco Derrick & Equipment Company and was Chief Engineer of the Emsco Houston Plant for a brief period. From 1945 to 1947 he was an oil field engineer with Western Gear Works, and in January 1947 joined Waldrip Engineering Company. Mr. Smith has a number of important oil field equipment patents to his credit.

Members of Shell Oil Co. have been taking a leading part in many recent Pacific Coast conventions of professional societies. Joseph C. Waterman, Bakersfield geophysicist, discussed the discovery of Ten Section field before the Society of Exploration Geophysicists in Los Angeles. George A. Nelson, Shell Development engineer, presided as section chairman at several meetings of the Western Metals Congress, San Francisco. Dr. Arthur S. Huey, San Joaquin division geologist, addressed the American Association of Petroleum Geologists in Los Angeles. His topic was on the geology of the basement complex in the Edison field.

Eardley Appointed Chief Engineer by Standard

Standard of California today announced the appointment of W. A. Eardley as chief petroleum engineer in the company's producing department. He succeeds E. G. Gaylord, who recently was elected a vice president and director of California Research Corporation.

W. A. Eardley

A graduate of Stanford University, Eardley joined Standard in 1926 upon completion of his college studies. He since has served as petroleum engineer in southern California and in the company's home office in San Francisco.

In 1943 he was named supervising petroleum engineer in San Francisco and held that position at the time of his recent appointment.

Eardley resides in Redwood City.

H. D. Collier, chairman of the board of directors, Standard of California, was among those honored by the Government of the Republic of China, which formally recognized leaders of 102 American business organizations for their parts in the training of some 1200 Chinese technicians during the past year.

President of the new Antelope Valley Oil Co. of Los Angeles is Adolph W. Von Lange. Fred Netzhammer is vice president, Julius Dietzmann, secretary-treasurer and superintendent, and Young Bros., drilling contractor.

Stemen Heads Valley Division for Waldrip

William E. Stemen has been named manager of the San Joaquin Valley Division of Waldrip Engineering Company. His headquarters will be at Waldrip's new valley warehouse at 30th and M Streets, Bakersfield, California. Telephones are Bakersfield 88564 and 88565.

Except for three and one half years in the U.S. Navy, Bill Stemen has been a resident of the Taft-Bakersfield area for the past twenty years. He attended Kern County High School, Bakersfield Junior College and graduated from the University of California at Berkeley with a B.S. degree in Electrical Engineering. For three and one half years he was an Airborne Radio-Radar Officer with the U.S. Navy and took part in many of the major campaigns in the South Pacific including Marshall Islands, Truk Raids, Hollandia, Palau Raid, Marianas, Palau, Philippines, Formosa, South China Sea, Iwo Jima, Japan Raids and Okinawa. His medals include Admiral's Commendation, Bronze Star Medal and Presidential Unit Citation.

Wm. E. Stemen

Both before and after the war he was employed by one of the largest oil companies in the Taft-Bakersfield area as an engineer. His wide and varied experience with drilling and producing equipment particularly suit him to his present position.

Peavy Named Chief Engineer for Houdry

Appointment of Dr. Claude C. Peavy as Chief Engineer of Houdry Process Corporation has been announced by Arthur V. Danner, Executive Vice-President of the Corporation.

Dr. Peavy joined Houdry Process Corporation a little over a year ago as Chief of the Process Design

Dr. Claude C. Peavy

Division after many years experience in all phases of petroleum refining engineering, including catalytic cracking. He came to Houdry from Socony-Vacuum Oil Company's Refinery Engineering Division where he was Chief Process Engineer. Prior to his five years of service with Socony-Vacuum he had been an engineer for E. B. Badger & Sons Co. for nine years. During his service with the Badger Company he worked on the design of the first commercial Houdry Fixed-Bed units and also saw engineering service in several foreign countries.

At the same time, Mr. Harmon J. Monnik was made Chief of the Mechanical Engineering Department of Houdry. Mr. William C. Dickerman will be in charge of Process Design.

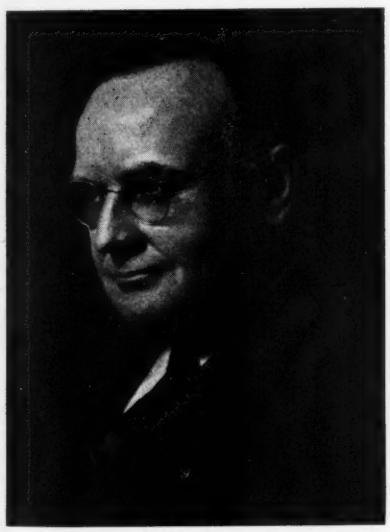
Development Engineering will continue to be carried on at the Houdry Laboratories near Marcus Hook, Pennsylvania, under the direction of Raymond C. Lassiat.

L. A. Steel Casting Buys Warman

A merger of major importance to western industry was completed April 14th with the purchase of the Warman Steel Casting plant by the Los Angeles Steel Casting Company.

Operations of these two leading firms under one management will provide one of the country's most complete steel casting services, and marks another expansion in the 40 years steady growth of Los Angeles Steel Casting Company, the southland's oldest steel foundry.

During the war this firm was in full production of war goods several weeks before Pearl Harbor and won 2 gold stars for its early award of a Maritime "M". Quickly converting to peacetime operation the demand for steel casting services and the company's stock products of Nikeladium steel-flanged fittings and Tamprite tips for sheepsfoot tampers, was so great that additional production equipment became necessary. The purchase of the Warman Company was the answer to this need.



C. B. Tibbetts

Top management of the mergered firms will be as follows: Mr. C. B. Tibbetts, President and General Manager; Mr. E. S. Atkins, Secretary & Treasurer; Mr. Ralph A. Lewis, Sales Manager; Mr. G. B. Emmett, Works Manager; Mr. W. B. Emmett, Superintendent of both plants; Mr. Carl Wissmann, Chief Metallurgist.

In announcing the acquisition of the Warman Company, Mr. Tibbetts stated. "The addition of the Warman facilities will enable us to more completely serve the trade with carbon steel and both low and high alloy castings from one pound to 10,000 pounds. We intend to modernize the Warman plant as soon as possible and provide the most up-to-date facilities available to the buyers of steel castings in this area."

Ralph A. Lewis

As yet no official announcement has been made of the financial consideration involved in the transaction.

Universal Oil Products Adds Prominent Chemist to Board

Announcement has just been made of the election of Mr. Carl S. Miner to the Board of Directors of Universal Oil Products Company, Chicago.

A native of Iowa, Mr. Miner attended Coe College, Cedar Rapids, and the University of Chicago from which he graduated in 1903 with a B.S. degree in chemistry. Immediately afterwards he served as a research chemist for Corn Products Refining Co. In 1906, Mr. Miner resigned to establish the Miner Laboratories. He continues to direct the activities of the company which he founded more than 40 years ago.

Mr. Miner is credited with many scientific achievements during his long association with the chemical profession. Listed in American Men of Science, his name is denoted by a star which indicates that he is among the leading thousand scientists in the United States. In 1940 he was the recipient of a Modern Pioneer Award from the National Association of Manufacturers.

During the war, Mr. Miner was a consultant to the Rubber Survey Committee and a member of the Chemical Referee Board, Office of Production Research and Development, War Production Board.

Mr. Miner is a member of the American Chemical Society, the American Association for the Advancement of Science, the American Association of Cereal Chemists, the American Oil Chemists Society, the American Society for Testing Materials, the Institute of Food Technologists, and the Alpha Chi Sigma, Sigma Xi, and Phi Delta Theta fraternities. He is a member of the Board of Trustees of St. Luke's Hospital, Chicago.

A son, Dr. C. S. Miner, Jr., and a daughter, Dr. Barbara M. Parker, are associated with him in the Miner Laboratories which are located in Chicago.

API Meeting

(Continued from Page 7)

The control of sand production through control of flow into the well has not been successful. Successful application would involve such low rates of production as to make it impractical under competitive conditions.

Standing on P-V-T Correlations

M. B. Standing, Standard Oil Co. of Calif., presented a general pressure-volume-temperature correlation for mixtures of California oils and gases. The paper gave correlations of bubble point pressures, formation volumes of bubble point liquids, and formation volumes of gas plus liquid phases as empirical functions of gas-oil ratio, gas gravity, oil gravity, pressure and temperature. Although the correlations are on California crude oils and gases, comparisons are made for the various crudes reported by Katz. The results of the correlations are presented in the form of calculating charts in order to facilitate the use of the data.

Rising Honored by Association

Wayne Rising, Vice-President and General Manager of Ducommun Metals and Supply Co., distributors of steel, brass, copper, pipe, tubing, tools, abrasives and industrial supplies, has been elected president for the 1947-1948 term of the Southern California chapter of the American Steel Warehouse Association.

Wayne Rising

Mr. Rising's broad general experience with Ducommun in many different departments during the past 25 years equips him to serve the Association to best advantage.

Jack Delaney of Reliance Regulator Corp. is a proud Grandfather for the first time. An eight pound boy was born on May 7th to the happy parents, Jack's daughter and son-in-law, Mr. and Mrs. E. F. Garnett.

Mr. Garnett is with the Southern California Gas Co.

O. W. Chonette, Texas Co., spoke on "Requirements for 18,000-ft. Drilling," and George Miller, Oil Base Drilling Fluids Co., on "Oil Base Drilling Fluids" at the meeting of the API Long Beach chapter in Shell Recreation Hall.

R. J. Talbert, Texas Co. geological office at Bakersfield, has been transferred to Los Angeles as head clerk in the Southern California geological headquarters. During the war, he took time out from his oil duties to serve five years in the Army. He was first with General Headquarters in the Southwest Pacific and later in the General Headquarters Service Group in a number of battle areas.

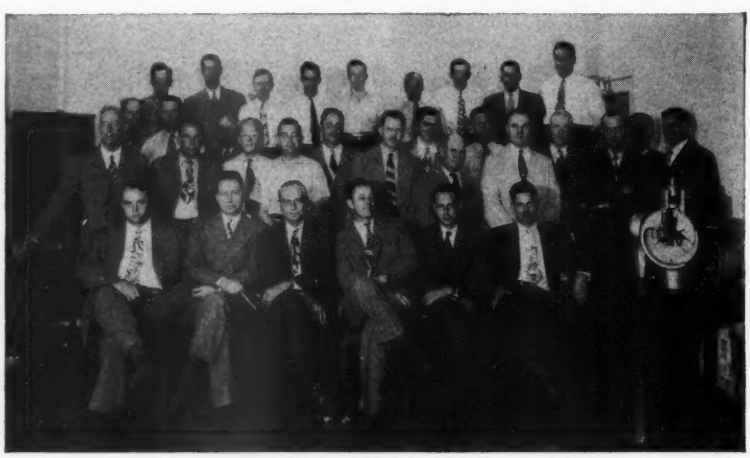
Carlson Heads New Department for Marman

Marman Products Company, Inc., announces the appointment of Mr. Howard R. Carlson to head the recently formed section of Petroleum Field Service Engineering. This section will have a two-fold purpose. The first will be to study the clamping problems of the petroleum industry in order to engineer, develop, and present new and more efficient clamping devices. The second will be to extend customer service in working out field clamping problems and in meeting emergency delivery requirements.

Howard Carlson, a graduate of Oregon State University, began his career as an industrial engineer. A Lieutenant in the Navy, he has been with Marman since V-J Day. Carlson is married and has one child, a boy. He will be on an extended field trip starting early in May when he plans to introduce the new Marman line of Pipe Leak Clamps to Petroleum activities in Texas, Oklahoma, etc., and to study clamping applications.

Howard R. Carlson

The many hundreds of guests at Standard's superlative cocktail party at the Los Angeles Biltmore Hotel, preceding the API production division banquet, represented all branches of the oil industry. Spotted during the festivities were Reg Stoner, Doug Graham, George O'Brien, Bill Pemberton, Wally Curtis, Sam Dickey, Frank Morgan, Bob Roberts, Lawrence Vander Leck and all luminaries from all parts of California.



NEW CAMERON FORGED STEEL WELL HEADS HIGHLIGHT SALES CONFERENCE

Cameron sales and field service men met April 24 at their Houston headquarters to hold a 3-day conference which was devoted principally to the Company's new line of forged steel casing heads, tubing heads, and Christmas tree flow wings.

The men in the picture are, front row (left to right)—Herbert Allen, Madden Works, Bill Collins, Geo. E. Myers, Carl R. Griffith, Raymond C. Buchanan; middle row—Sidney S. Raimer, Alford A. O'Connor, William Roy Davis, Ivey E. "Fox" Moses, Morey Zorgdrager, Xavier R. Showers, Atlee D. Cathey, Jack W. Harris, J. R. Jerabeck, Joseph A. Tennant, Jr., Carnie L. Potts, Frank H. Isaacks, Robert F. Farmer, Edmond L. Lorehn, Ruric N. "Roy" Bean, H. G. "Jeff" Musolf, Homer E. Brown; top row—Richard W. Gustine, Adolph L. Scharck, Frank M. Allen, Robt. W. Gunsalus, Willie R. Price, George N. Moughon, Douglas V. Clemons, Judson J. "Doc" McCann, Charles W. Giraud.

THIS LAUGH OFF!!

Judge: "You're fined twenty-five dollars and costs.

Lady Shopper: I'm sorry, judge, but that's a little more than I care to pay.

The famous psychologist had just delivered a most interesting lecture, and was now conducting a question session.

A timid little man down front held up his hand, and was recognized.

"Doctor," he said most respectfully, "did I understand you to say that a good poker player could successfully handle any sort of executive job?"

"That's exactly what I said," was the confident reply.

"Tell me, Doctor," asked the little man, "what would a good poker player want with a job?"

An Irishman wrote his brother in Cork:

"America is a wonderful place. Here I am pulling down a Lutheran church and getting $10 a day for it."

The absent-minded office manager pulled the typewriter down on his lap and began to unfasten the ribbon.

Then there's the one about the guy who shipped a pair of rabbits from coast to coast by air express. The crate arrived with two rabbits. That's fast transportation!

The village bank had been forced to close its doors and Ike, although the town's champion ne'er-do-well, was loudest in his denunciations.

"Aw, what are you kicking about?" growled a comparatively large depositor. "You couldn't have had more than a couple of dollars in there."

"Well," retorted Ike, "if I'd known this was gonna happen I could of been overdrawn, couldn't I?"

If there's anything wore than a
waffle that's cold,
Or mashed potatoes three days old,
It's suddenly meeting a fat old hen
That you loved at high school in
nineteen ten.

Pat and Mike had just arrived from South Ireland, and they were not acquainted with our traffic signals. They were waiting at an intersection when the light turned from red to orange. Everybody but these two rushed across the street. The orange light, of course, quickly turned green, and as the Irishmen started across, Pat observed to his partner: "Shure, an' they don't give the Protestants much time to git across, do they?"

They laughed when I sat down at the piano, but when the little blonde soprano gave me the key to A flat . . . boy, how I accompanied her.

Judge: "Do you challenge any of the jury?"

Defendant:: "Well, I think I can lick that little guy on the end."

Pretty Girl:: "Will you buy a ticket on a raffle for a young widow?"

Tired Business Man:: What's the use? If I won, my wife wouldn't let me keep her."

"How about two of them?" asked the druggist of the man who was buying a toothbrush. "One for your wife?"

"No thanks. When I buy a new one, I give her the old one."

Several other customers in the store gasped, and then he added. She uses it to clean her shoes."

Hubby: "Some day, beloved, I shall die and leave you."

Wife (tenderly): "How much?"

A charming lady named Hopper
Committed a sad social cropper;
She went to South Bend
With a gentleman friend;
The rest of the story's improper.

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Nomads April Meeting

The regular monthly dinner meeting of the Los Angeles Chapter of Nomads was held at the Jonathan Club in Los Angeles on Wednesday evening, April 16th. President Bob Eiche presided and Vice President Fred Ripley acted as master of ceremonies to introduce the main speaker of the evening.

After the introduction of guests, Past President Elmer Decker inducted the following new members who had previously been voted into the Chapter:

John McEwen
William S. Althouse, Jr.
Robert Taill Harcus

Ernie Fowks was asked to report on the activities of the Membership Committee of which he is chairman and after doing so he announced that new membership applications had been compiled and were ready for use.

J. L. Ray and A. J. Phelan

The speaker of the evening was Mr. J. L. Ray, Assistant Chief Engineer of the Northrup Hendy Company of Hawthorne, California, who presented a discussion on gas turbines which was illustrated by numerous slides showing the development of these machines. He was assisted by Mr. A. J. Phelan, Chief Engineer of the same company.

Among the numerous guests present at the meeting were the following oil men from foreign countries:

Paul Shighes, Colpet Company (Cueuta, Columbia).

Henri C. Piek, Standard Vacuum Oil Company (Netherlands East Indies).

Paul Molidor, Tropical Oil Company (Colombia).

B. C. Haney, Socony Vacuum Oil Company (Colombia).

T. D. Foster, Standard Vacuum Oil Company (Dutch East Indies)

T. C. Oakes, Iraq Petroleum Company (Iraq).

M. W. Zaikowsky, Texas Petroleum Company (Venezuela).

Whittier Test Idle

With bottom of the hole at 3580 ft. O'Melia Oil Co.'s Pellissier No. 9 in Sec. 17-2s-11w at Whittier Heights still stands idle.

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